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SPECIAL AND ADVANCE  
LETTERS

*September 23 — December 24, 1921*



HARVARD UNIVERSITY  
COMMITTEE ON ECONOMIC RESEARCH  
CAMBRIDGE, MASSACHUSETTS, U. S. A.

1921

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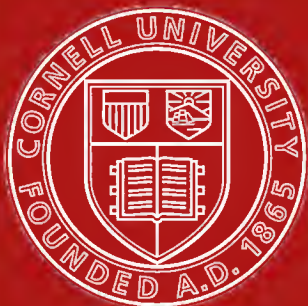
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*September 23 — December 24, 1921*



HARVARD UNIVERSITY  
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CAMBRIDGE, MASSACHUSETTS, U. S. A.

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# ERRORS

OCTOBER 8, 1921

Page 5, Chart 3. The caption for the drawing in the upper right-hand corner should read *Chemicals* instead of *Chemicals, Oils, Paints, etc.*

OCTOBER 22, 1921

Page 3, Chart 2 and page 8, Table B. The adjusted indices here shown for the textile group and for its two components, the cotton industry and the woolen and worsted industry, were replaced, in the Special Letter of November 26, 1921, pp. 4-5, by revised figures, as explained on page 4 of that Letter.

Page 4, Chart 3. The annual averages, 1905-14, apply to twelve-month periods ending August 31, not to calendar years as plotted.

Page 5, Chart 4. The annual averages, 1904-17, apply to twelve-month periods ending June 30, not to calendar years as plotted.

Page 7, Chart 5 and page 8, Table B. Note the following corrections:

		WOOLEN AND WORSTED GOODS Per cent of normal activity of spindles and looms	CARPETS AND RUGS Per cent of carpet looms active
1921	January . . . . .	59.3	54
	February . . . . .	68.8	50
	March . . . . .	82.2	40
	April . . . . .	94.7	44
	May . . . . .	103.6	46
	June . . . . .	107.1	42
	July . . . . .	106.4	49

NOVEMBER 1, 1921

Page 1, 2d line. Read *speculation and banking* instead of *speculation and business*.

NOVEMBER 8, 1921

Page 5, footnote 1. This footnote should read as follows:

<sup>1</sup> Expressed as percentages of the average price of the respective commodities for 1898-1914. Similar figures for all the groups of the Bureau of Labor Statistics are: farm products, 3.12; house-furnishing goods, 2.65; lumber and building materials, 2.60; food, etc., 2.15; all commodities, 2.06; miscellaneous, 1.45; cloths and clothing, 1.39; fuel and lighting, 1.35; chemicals and drugs, 0.45; metals and metal products, —0.02. Similar figures for 27 agricultural and mineral raw products, 71 articles manufactured from them, and the 98 commodities combined, are, respectively, 2.62, 1.74, and 2.22.

Page 8. In the last two sections of the table, the prices for the year 1913 for steel beams and alcohol should read .015 and 2.51, respectively, instead of .105 and .251.

DECEMBER 15, 1921

Page 3, 11th line from bottom of page. Read *unwillingness* instead of *willingness*.



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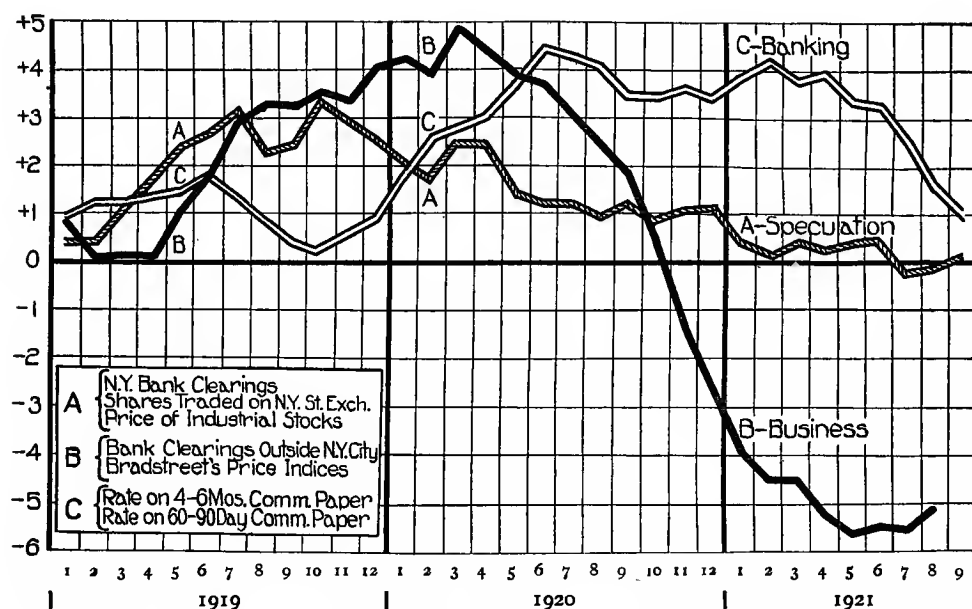
# GENERAL BUSINESS CONDITIONS

*Advance Letter — October 1, 1921*

## THE INDEX

**T**HE favorable movements, recorded in August, of the curves of our Index Chart, representing speculation and banking, have continued in September. These movements reflect improved fundamental conditions, and forecast increased business activity and higher commodity prices.

The trough of the business depression has, very clearly, been passed. Curve B of our Index Chart, representing business, reached the end of its very rapid decline in May; the



INDEX CHART. The items locating curves A, B, and C all refer to *complete calendar months* and the points are plotted in the middle of the spaces allotted to the months.

volume of manufacture, as shown by the index published in our *Special Letter* of September 20, halted its abrupt decline in February; prices of important commodities such as copper, tin, lead, rubber and cotton have recovered after a long period of weakness, and of late unemployment in general has slightly decreased. These facts do not mean that business is not depressed but rather that we are rising out of the trough and beginning an upward swing. In other words, the depressed condition of business, which has gripped agriculture, mining, and manufacture, is now being followed by a recovery which, although very slow, is clearly registered by most of the available indices. If conditions in Europe were more nearly normal, and there were no possibility of a railroad strike in the United States, we could confidently count upon continued improvement. There are still a number of disturbing factors in the situation which have made recovery slow and may reverse the present favorable indications. On this point no certain conclusion is possible at this

time, but it is clear that the favorable movements recorded by our Index for August and September give considerable assurance that business conditions are on the mend.

The bulk of the upward movement of curve A of our chart results from an increase of 5 per cent in the price of industrial stocks and 18 per cent in the number of shares traded on the New York Stock Exchange. New York clearings increased 3 per cent, although figures for September have usually been somewhat lower than for August. Clearings were somewhat increased by the payment of the third installment of the income tax on September 15. The continued downward movement of curve C is due to the fact that interest rates on commercial paper decreased at a time when the normal movement of such rates is upward.

## SPECULATION

The price of railroad and industrial stocks advanced during the first part of September. Dow, Jones and Company's index of the price of 20 railroad stocks reached \$74.30 on September 13; declined irregularly to September 20, and has since risen, standing at \$74.69 on September 23. The index of industrial stocks reached \$71.92 on September 10, and has been lower since. The average for September is 5 per cent above that for August. The average price of 40 bonds has advanced since the first of the month, reaching \$79.52 on September 26, a figure 1.6 per cent above the high point of August 4. Advance has been principally in railroad and public utility bonds; that in industrials has been slight.

Shares traded on the New York Stock Exchange numbered approximately 13,100,000 during September, an increase of 18 per cent over August. New York clearings were 15,040 million dollars, an advance of 3 per cent over August. A slight decrease usually occurs.

Despite recent increases in prices, there is no evidence that outside buying is taking place on any considerable scale, and trading seems still largely confined to professional operators. Better earnings on the part of industrials seem necessary to attract outside investment and speculation, and high interest rates and the losses resulting from depression in business tend to retard any such development in the immediate future.

## BUSINESS

The advance from the trough of the depression which was evident in August has continued through September. The rapid increase in cotton prices culminated on September 10, with spot quoted on the New York market at 21.10 cents per pound. Since that date the price has fluctuated between 19.50 and 20.50 cents per pound, except on September 17, when it dropped to 18.60 cents and September 27 and 28, when it reached 21.55. The Liverpool and Manchester markets are reported active. The South seems disposed to sell at present prices. Receipts of cotton have been large, both at the cotton-collecting ports and interior towns. Continued sales at the current price levels will greatly facilitate liquidation and rehabilitate the purchasing power of the South for goods from all sections. In the manufacturing and distributive end of the industry, doubt exists as to the extent to which cotton goods, at the higher prices necessary to meet the increases in the cost of raw material, can be disposed of to the consumer. A reaction in the large primary markets for cotton goods has followed the price advance.

In the wool manufacturing industry the smallest proportion of idle worsted spindles since the beginning of the recovery of that industry was reported for September 1, while more woolen spindles were idle on September 1 than on July 1 and August 1.

Further advance in the production of iron and steel after the increase recorded last month is indicated for September. Pig-iron prices are firm; prices for iron and steel products are still unsettled. An advance in sheet prices has followed that recently made in wire. Exports of iron and steel last month, however, reached the lowest (estimated) total since January 1909. Improvement has occurred in the non-ferrous metal markets; copper, lead, and tin have advanced in price, and the market for zinc is reported firmer. The price of crude rubber also has advanced.

Unemployment for August was less than for July. The pay rolls reported to the Bureau of Labor for August were 1.4 per cent larger than for July. Unemployment increased in the automobile, woolen, silk, and cigar manufacturing industries, and the mining of coal; and it decreased in the iron and steel industry, carbuilding and repairing, cotton manufacturing and finishing, and in the hosiery and underwear, men's clothing, leather, boots and shoes, and paper making industries.

The rapid marketing of wheat is reflected in exports of that product, especially during August. Monthly exports for the last three years, and the pre-war years 1913-14 are given below:

#### EXPORTS OF WHEAT FROM THE UNITED STATES

(In millions)

	1913		1914		1919		1920		1921	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	<i>bus.</i>	<i>dollars</i>	<i>bus.</i>	<i>dollars</i>	<i>bus.</i>	<i>dollars</i>	<i>bus.</i>	<i>dollars</i>	<i>bus.</i>	<i>dollars</i>
January .....	8	8	5	5	10	24	8	21	21	45
February .....	4	4	4	4	6	14	5	12	18	37
March .....	5	5	3	3	10	24	7	17	15	28
April .....	7	7	3	3	17	41	4	11	18	29
May .....	7	7	7	7	14	35	11	30	26	41
June .....	6	6	7	7	16	40	13	38	25	40
July .....	9	9	26	24	6	14	24	71	25	37
August .....	24	23	24	24	13	31	28	81	59	81
September .....	12	11	26	29	17	41	31	89	..	..
October .....	7	7	20	22	14	33	36	99	..	..
November .....	4	3	19	23	15	36	26	68	..	..
December .....	6	5	29	36	10	23	26	62	..	..
Total .....	99	95	173	187	148	356	219	599	..	..

The wheat crop for the last two years has been somewhat less than the 1915-19 average. Nevertheless, shipments since June 1920 have been large; and those for the first eight months of 1921 have in each month exceeded those for 1920. Exports for August of this year, which total 59 million bushels, are more than twice those of August of a year ago, which exceeded August exports for the preceding decade. The value of exports for the two years is, however, almost exactly the same. Exports for the first eight months of 1921 equal those of the entire year 1919 and exceed those of 1913; they are greater than the corresponding eight months of all the years given above. Apparently 1921 shipments have been made earlier than in past years. Weekly exports for the week ending September 3 were larger than in the preceding four weeks, but they have fallen off decidedly since that date.

As with wheat, the marketing of cotton has been rapid this year. The quantity exported, compared with that shipped in other years, has not been relatively so great as is the case with wheat, but August exports — 495,000 bales — although less than in July, exceed those for August for each year of the last decade. Weekly exports have fallen off since the week of September 3.

## BANKING

The strengthening of the position of the federal reserve system, and steady improvement in the general banking situation have continued during September. The reserve ratio has increased from 66.2 per cent on September 7 to 68.7 per cent on September 21. Continued increase in gold holdings, and declines in deposits and federal reserve notes in actual circulation have brought about this increase. Although the last item was larger in the first week of the month than in the last week of August, because of holiday demand, a slowing up of the rate of decline maintained during the last six months is not discernible. On the other hand, net demand deposits of the reporting member banks seem to have shown an upturn since the latter part of August.

The most striking development in the banking situation during September has been the lowering of the rediscount rate from  $5\frac{1}{2}$  to 5 per cent by the New York Federal Reserve Bank on September 22 and by the Boston Federal Reserve Bank on the following day. The Bank of England, which was expected to follow any such action, still maintains the  $5\frac{1}{2}$  per cent rate. The lowering of the rediscount rate is in accord with the continued decrease in interest rates throughout the country. The average monthly rates show a continuous decline to date from August 1920 for 4-6 months commercial paper, and from October 1920 for 60-90 day commercial paper. Present rates are  $5\frac{1}{2}$ — $5\frac{3}{4}$  per cent. It is noteworthy that the decreases of the last few months have been contrary to the usual seasonal movement. Prior to the foundation of the federal reserve system, July usually showed an increase over June; August over July, and September over August. Thus to date any tendency of the crop-moving season to enhance interest rates has not appeared. It has been reported that funds have flowed into New York from out of town banks during September. Call rates, which stood at 6 per cent during the first three weeks of August, have been lower since; they reached  $4\frac{1}{2}$  per cent on the twenty-first, and are now 5.

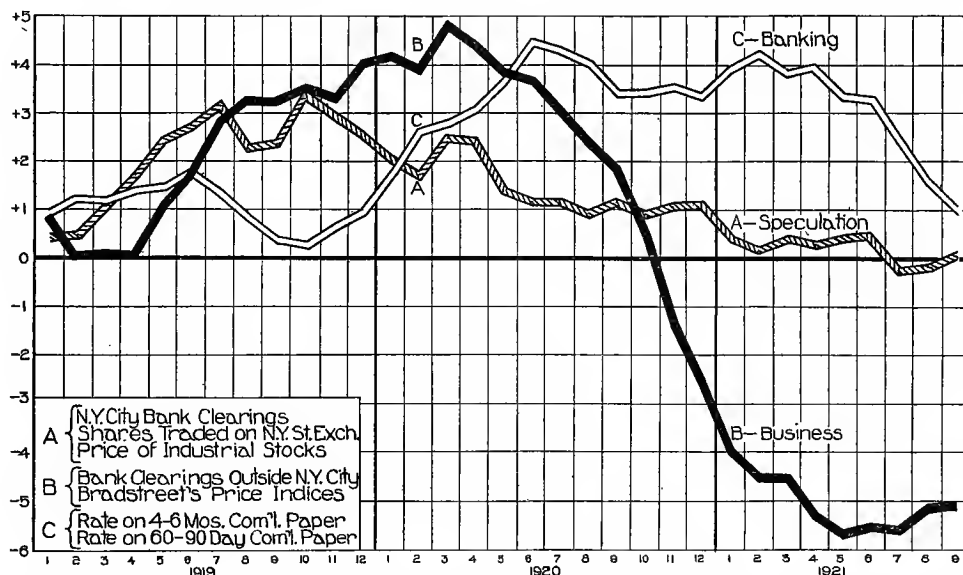
An indication of the pressure which has fallen upon the primarily agricultural districts since the beginning of the harvest season is supplied by the borrowing of the federal reserve banks of the Minneapolis, Dallas, Richmond and Atlanta districts from the other reserve banks. On June 8 the total of such borrowings was 25 million dollars. This figure increased each week, with two exceptions, until it reached 71 million dollars on September 14. The borrowings of the Richmond bank, except for the last two weeks in August, have been the largest, though without a definite trend upward. The Dallas bank, the borrowings of which exceeded the Richmond bank for the weeks just mentioned, shows the largest increase between the two dates; its borrowings rose from  $2\frac{1}{2}$  to 25 millions of dollars. The highest figure of the Minneapolis bank was 18 millions on August 24. The Atlanta bank has increased its borrowings from 2 millions on August 3 to 16 millions on September 24. It is the only bank showing an increase after September 14; the decline for Minneapolis has been steady since August 24, while the figure for the Dallas bank shows a decided decrease since August 31.

# GENERAL BUSINESS CONDITIONS

*Advance Letter — October 15, 1921*

## THE INDEX

**C**ONTINUANCE, during September, of the slow improvement in economic conditions which has taken place during recent months is indicated by the very slight upward movement of curve B of our index chart, representing business. Since last May, when the trough of the present depression was reached, its movement has been upward, showing clearly the improvement since that month. The process has, however, been extremely slow. It is clear now, from the curves of our chart, that we may expect continued advance, but that the rate of improvement, during the coming few months at least, will not be rapid.



Although curve A, representing speculation, has moved upward for the last two months, the recovery has been slight. The very marked decline in curve C, representing banking, reflects during the past three months a decline in interest rates on commercial paper which occurred at a time when their trend is normally upward. Even after the substantial decrease ( $\frac{1}{2}$  per cent) during the last week of September, rates are still high ( $5\frac{1}{2}$  to  $5\frac{3}{4}$  per cent) for this period of the economic cycle, and their height operates to retard rapid expansion of speculation or business.

The curves of our chart, then, indicate that the betterment in fundamental conditions which in June was technical only and did not become substantial until August, has been maintained in September; that the improvement during the month has been very slightly more than that which normally takes place at this time of the year; and that the advance noted will continue during coming months, although probably at a very moderate rate. These favorable indications may be reversed by untoward developments in Europe, or a

railroad strike in the United States; but, apart from such unfavorable contingencies, assurance is given by our index chart that business conditions are slowly righting themselves.

In judging the present outlook account must be taken of a new factor which may prove extremely important in accelerating revival. It is evident that the federal government is anxious to do what it can to restore business prosperity; and, while some of its measures may not be effectual, others may bring about conditions, such as easier money and credit, which will appreciably hasten recovery. The pressure of agricultural and other interests is not alone responsible for the policies which seem to have been adopted at Washington; it is, indeed, quite inevitable in such times as these that the assistance of the government should be invoked and rather freely granted. With the agencies now at its command, and with the powerful federal reserve system in operation, it is probable that the government can stimulate business activity in no slight degree at this juncture. On a falling market, such as we had last winter and spring, stimulants would have had no effect; but now that the bottom has been reached and recovery has begun, it is impossible to doubt that governmental action may be effective, at least for the time being. The ultimate results may be good or bad; that question cannot be considered in this letter. The thing of present importance is to recognize that we may be entering upon a period of renewed credit expansion which may accelerate materially the recovery of business, which is now proceeding slowly under the influence of forces that normally operate at this phase of a business cycle. Gold imports, if they continue, will supply conditions favorable to the success of the effort to bring about what is frequently, and very inaccurately, referred to as "secondary" inflation.

## SPECULATION

The price of both railroad and industrial stocks has fluctuated only slightly during the past few weeks. Dow, Jones and Company's index of the price of 20 railroad stocks reached \$74.69 on September 23, the highest point since August 2. It decreased to \$73.45 on the twenty-eighth, and has not advanced beyond the figure of the twenty-third since. The index of the price of industrial stocks has not shown a distinct trend since it reached \$71.92 on September 10. On October 1 it stood at \$71.68, and has since been lower. The steady increase in bond prices during September culminated on the twenty-sixth, when Dow, Jones and Company's index stood at \$79.52. It fell in the next two days to \$79.22, and

## CLOSING PRICES OF LIBERTY AND VICTORY BONDS

### *New York Market*

Issue	First		Second (cvs.)	Third (reg.)	Fourth	Victory (reg.)
Rate	3½ * per cent	4½ per cent	4½ per cent	4½ per cent	4½ per cent	4½ per cent
Date of maturity	1932-47	1932-47	1927-42	1928	1933-38	1922-23
Date						
September 1.....	\$87.40	\$87.90	\$87.84	\$91.80	\$87.92	\$98.80
September 9.....	87.26 †	87.94	87.94	91.88	88.08	98.88
October 1.....	88.46	90.82	90.52	93.74	90.90	99.28
October 8.....	89.88	94.60	93.00	95.16	93.30	99.20
Increase September 1 to October 8....	2.8 %	7.6 %	5.9 %	3.7 %	6.1 %	0.4 %

\* Tax exempt.

† Low for the month.

has since been higher. The average price for September was 1.4 per cent above that for August.

The movement in the prices of Liberty bonds which, except for the first  $3\frac{1}{2}$ 's, has been almost continuously upward since September 1, is one of the most noteworthy features of the bond market. The table above presents closing prices of various issues on four days during September and October. Large funds held in corporate treasuries, which have not found outlet in business channels, are being used in the purchase of these securities, and such buying is regarded as a factor of importance in increasing prices, in addition to the general feeling that prices are low. Some of the purchases recorded have been of large amounts.

## BUSINESS

The slight upward movement of curve B is caused by an increase in Bradstreet's price index, which stood at \$11.09 on September 1 and \$11.19 on October 1. Of the groups reported, fruits, textiles, metals, coal and coke, naval stores, building materials, and miscellaneous products advanced, while breadstuffs, live stock, provisions, hides and leather, oils, and chemicals and drugs declined. Outside bank clearings for September were 13,210 millions of dollars, an increase of 3 per cent over the amount for August. This is merely the usual September increase.

There are various indications of business improvement during September and thus far in October. The spot price of middling upland cotton on the New York market, which reached its highest, 21.55 cents per pound, on September 27 and 28, has been lower since those dates, but has not again fallen below 19.5 cents. The disturbance wrought in the market for cotton goods by the rapid increase in the price of the raw material during the first ten days of the month, and which prevented many mills from quoting prices for several days, has been largely rectified, and new prices have been quoted on several branded lines. Some lines, however, were still held "at value" at the end of the month. Increase in the prices of cotton goods has not been rapid, and sales at the higher levels were comparatively small during the first three weeks of the month.

The production of pig iron in September was 985,529 tons, an increase of 3.3 per cent over August and of 14 per cent over July. Eighty-two furnaces were in blast on October 1, in contrast to seventy on September 1. Further increase for October is indicated. Unfilled orders of the United States Steel Corporation, which totaled 4,560,000 tons on September 30, showed a gain over August which, although small — 0.7 per cent — is significant because the first recorded since July 31, 1920. Steel ingot production rose 3.2 per cent. The increased activity in steel wire, sheets, tin plate and pipe continues, without corresponding improvement in rails and steel plate, shapes, and bars. The price decline in the last three products appears at least to have been checked. The production of bituminous coal for the month was approximately 35,105,000 tons, an increase of 1.6 per cent over the August figure.

The rapid marketing of wheat has brought a sharp decline in price since September 9. On that date the price of no. 2 red wheat, spot, on the New York market was \$1.47 $\frac{1}{2}$  per bushel. On October 1 the price had fallen to \$1.28 $\frac{1}{2}$  and on the third reached \$1.15. It has been higher since. Much less liquidation has resulted from the large September grain movement into Minneapolis than normally would be expected. The causes assigned for this fact are lower prices, especially for oats and other small grain, higher cost of production,



and higher railroad rates, all resulting in a lower return to the farmer. More pronounced liquidation is expected later.

A slight decrease in unemployment is recorded during September. Weekly car loadings during the month, except for the week of September 10, in which the Labor Day holiday occurred, show a continuous increase. For the week of September 24, a decrease is reported in the loading of grain and grain products, which is in accord with the fact that the crop has been largely moved. Loadings of grain, however, exceeded those for the corresponding weeks in 1919 and 1920. The largest gain recorded for the week was in the loading of merchandise and miscellaneous freight; next in order followed coal, livestock, forest products, ore, and coke.

Bank clearings outside of New York City, which form probably the most reliable index of the volume of business transactions to be found, are given below. For the country as a whole they show the normal seasonal advance of approximately 3 per cent. New England clearings, however, remained almost the same as for August, while those for the Middle West showed a slight decline. Clearings for southern cities showed a gain of 14 per cent, reflecting improved conditions in that section. For cities in the remaining districts — Middle, Pacific, and Other West — clearings showed an increase only slightly greater than the normal seasonal advance.

#### OUTSIDE CLEARINGS: ACTUAL FIGURES

(Unit: \$1,000,000)

	Aug. 1921	Sept. 1921	Ratio of Sept. to Aug.
Middle *	2,909	3,014	103.6
New England	1,259	1,258	99.9
Middle West	3,672	3,591	97.8
Pacific	1,415	1,479	104.5
Other West	1,680	1,742	103.7
Southern	1,869	2,128	113.8
Total *	12,804	13,212	103.2

\* Excluding New York City.

#### BANKING

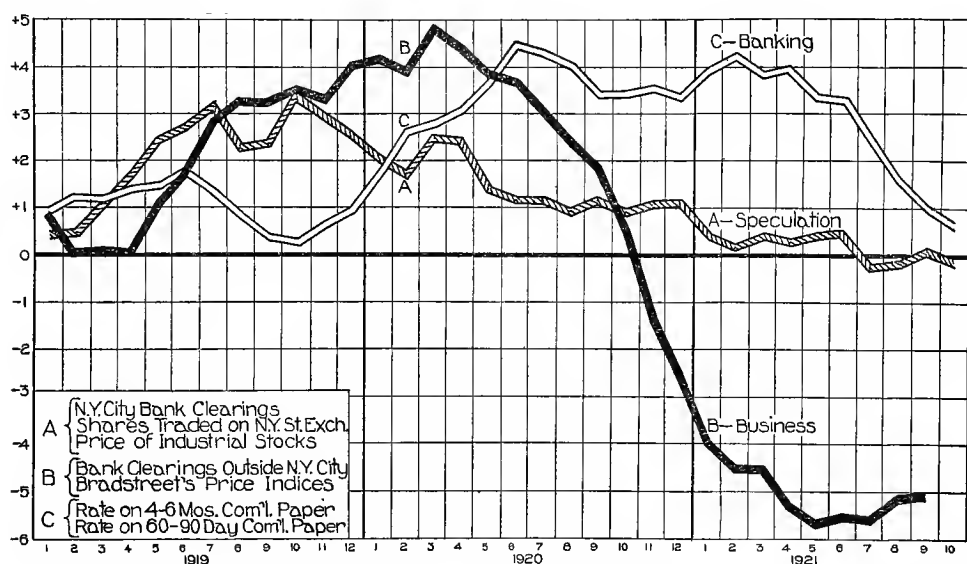
Since the first of October, two federal reserve banks have announced reduction of their rediscount rates. The Philadelphia bank lowered its rate from  $5\frac{1}{2}$  to 5 per cent on October 5, and the Minneapolis bank decreased the rate on paper not secured by government issues from  $6\frac{1}{2}$  to 6 per cent on October 6. The rediscount rates of the Boston, New York, and Philadelphia Federal Reserve Banks are now 5 per cent, those of Cleveland and San Francisco  $5\frac{1}{2}$  per cent, and those of the remaining banks 6 per cent. The federal reserve ratio stood at 69 per cent on October 5, the same figure as for the week before. This was due to an enlargement of the circulation of federal reserve notes, not fully offset by a decrease of deposits and an increase of gold reserves. Circulation and deposits are both lower than in the corresponding week in September. Call loan rates during the first week in October varied between  $4\frac{1}{2}$  and  $5\frac{1}{2}$  per cent, a decrease from the preceding week, but on the eleventh they were 6 per cent.

# GENERAL BUSINESS CONDITIONS

*Advance Letter — November 1, 1921*

## THE INDEX

NO pronounced change in business conditions is evidenced by the October movements of curves A and C of our index chart, representing speculation and business, respectively. The decline in curve C, reflecting decreasing interest rates, is at approximately the same rapid rate as that maintained since June. At this stage of the business cycle, a fundamental condition of improvement is a pronounced decrease in money rates, such as has been taking place since April. Even though such a decline has occurred, it has been sharp only



since last spring and actual rates are still above those which in pre-war years signaled steady advance in business. Nevertheless the decline is the most important evidence, at this writing, of future improvement. The decreased rates for the current borrowings of the federal government, noted below, are regarded as favorable to this development in that they make investment of private funds in such securities less attractive, and tend to draw them instead into industrial channels.

Curve A, representing speculation, has declined slightly during October, reversing the slightly upward movement maintained during the preceding two months. Neither of these movements, however, has been pronounced, and less importance is to be attached to the sidewise movement of curve A than the decidedly favorable movement of curve C. The extent to which curve A has been affected by the prospect of a railroad strike is difficult to gauge, but it is probable that, in spite of professed disbelief in its possibility, speculative activity has been decreased by the threat of a general walk-out.

The decline in curve A, representing speculation, is due largely to the fact that the usual seasonal advance in New York bank clearings has not occurred; these show an increase of 7 per cent, as against the usual advance of 20 per cent. The failure of the October figure to show the usual pre-war increase over September, however, is partly due to a non-business factor — income tax payments — which increased the September base of comparison. The number of shares traded on the New York Stock Exchange in October was about the same as in September. The average price of industrials was 2 per cent higher. The decline in curve C, representing banking, is caused by decreases in the actual rates on both 4-6 months and 60-90 day commercial paper. The first of these rates is usually the same in September and October, the second usually somewhat higher in the later month.

The failure of the threatened railroad strike to materialize has removed a disturbing factor which was affecting appreciably the immediate business outlook. It appears, however, that the unions have received assurance from the Railroad Labor Board that further reduction of wages will not be even considered for many months, and it is probable that this was the real objective of the union leaders in the whole affair. Nothing, therefore, has been really settled; and the only thing gained has been the clear demonstration that public opinion was overwhelmingly opposed to a strike. Perhaps this fact will lead to federal legislation making more adequate provision for handling railroad labor problems.

### SPECULATION

Between the first and seventeenth of October, the Dow-Jones index of the price of 20 railroad stocks showed an almost continuous decline, from \$74.58 to \$70.00. There has been a recovery since, though not sufficient to bring prices to the level of October 1. A less pronounced decrease in the first half of the month occurred in the price of industrial stocks, but this was followed by a substantial increase, which by October 29 had brought the daily average up to \$73.93, which was 3 per cent above the figure for October 1, and the highest point reached since the end of May. Shares traded on the New York Stock Exchange have numbered about 500,000 daily, though showing higher totals at the middle and end of the month. The index of the price of forty bonds, which had shown a pronounced increase during September, stood between \$79.30 and \$79.50 on the first ten days of the month, and then declined sharply reaching \$78.77 on October 18. Prices have been somewhat higher since. The decrease was due largely to the decline in industrial bonds; highest grade rails have, in fact, increased slightly during the course of the month.

### BUSINESS

During the last two weeks there seems to have occurred a slackening in even the slow rate of improvement maintained since the middle of the summer. Grain and cotton prices have shown a pronounced falling off from the high point of the season; prices of commodities in general have weakened, and activity in the steel and cotton goods markets seems to have lessened somewhat without as yet affecting production. It is difficult to gauge the extent to which the slowing down observed was the direct result of the threat of the railroad strike. Many business men did not expect a strike to occur under conditions so unfavorable to the unions. In at least one case — retail sales of coal for domestic consumption — expectation of the strike had a stimulating effect. Another element, which is reported to have retarded business expansion during recent weeks, is the expectation of lower railroad rates.

On October 22, the Interstate Commerce Commission rendered a decision reducing rates on grain, grain products, and hay. These rates are to be put in force on or before November 20. The principles upon which the reductions in the grain cases referred to above were based are such as to lead to the anticipation of further reduction. Rates on hard wood are among those now under consideration.

Reductions in rates have an important effect upon the market for commodities in which freight rates form a large percentage of cost, either to the manufacturer or buyer, because of the bulk of article or of the materials of which it is made. Buyers of these commodities tend to hold off, either until the reduction of rates will directly affect their expenses, or in expectation that price reduction, corresponding to the rate reduction, will be made. It is reported that the sales of steel have fallen off in the last two weeks, in the expectation of lower rates on steel and lower prices, following the recent reduction of 28 per cent on iron ore. This reluctance to purchase occurred at a time when the threatened strike might have been expected to stimulate sales.

Recently the market for cotton goods has been quiet. During September there was an increase of 4 per cent in cotton consumption, and an increase in employment of 2 per cent in cotton manufacturing and 3 per cent in cotton finishing. There has been a broadening of the woolen goods market with the demand brought on by cooler weather. Demand has favored moderately priced materials, while a feature of the wool market has been the large sales of medium grade wool. Idle spindles in the wool-manufacturing industry on October 1 formed 22.4 per cent of the woolen spindles and 8.6 of the worsted spindles. The figure for idle woolen spindles is the same as on September 1, and is about equal to the average for the first half of 1914. There has been a pronounced decrease in idle worsted spindles since August, when they formed 13.3 per cent of total worsted spindles. The October 1 figure is well below the pre-war normal.

More favorable developments are to be found in the lumber and oil industries. The former is active, with prices in some lines higher. The greatest improvement and advance is to be found on the Pacific coast; a feature of this trade is the increased sale in the eastern markets of western lumber, which has been transported via the Panama Canal. The yellow pine lumber industry of the southwest has likewise shown increasing business. Advances in crude oil prices, after declines since the first of the year, began in the Pennsylvania field on September 27. These have been followed in other fields, and the prices of refining products have in some instances moved upward. It is reported that sales of the crude product have slackened since the recent increase.

In the steel industry the market is, on one hand, reported to be less active than recently, while, on the other hand, production is reported to be holding up well. On October 24, Judge Gary announced that the U. S. Steel Corporation had cut the price of standard rails \$7.00 per ton. The price is now \$40, compared with a pre-war price of \$30 and a maximum, during the war, of \$57. On October 11, the *Iron Age* reports price recessions in wire rods, steel bars, and tin plates, and states that there has been price cutting in line pipe. The copper market has weakened somewhat. The production of bituminous coal has increased steadily since the first of the month.

## BANKING

Average interest rates on commercial paper for October were lower than for September; they are usually slightly higher. Rates have remained throughout the month at about the

height reached in the last week of September; on commercial paper the general rate is now  $5\frac{1}{2}$  to  $5\frac{3}{4}$  per cent, with some sales at 6. Call loan rates have ranged from 4 to 6 per cent during the month; they are now 6 per cent. Interest rates on treasury certificates have been reduced  $\frac{3}{4}$  of one per cent from the rate of September 1, because of large oversubscription to the last issues. Seven and one-half and twelve months certificates issued on August 1 bore rates of  $5\frac{1}{4}$  and  $5\frac{1}{2}$  per cent, respectively; six and twelve months certificates issued on September 15, 5 and  $5\frac{1}{4}$  per cent; while the five and ten and one-half month certificates to be issued on November bear rates of only  $4\frac{1}{4}$  and  $4\frac{1}{2}$  per cent.

On October 26 the federal reserve ratio was 70.8 per cent. This high ratio was largely the result of increased gold holdings, which formed about 95 per cent of the total cash reserve used to obtain the reserve ratio. Gold reserves amounted to 2,733 millions of dollars on the fifth, slightly less on the eleventh, and 2,786 on the twenty-sixth. Of the other elements in the ratio, reserve notes have declined since October 1, while total deposits have varied irregularly, but on October 26 were higher than during the preceding weeks of the month. Important items of the last report of the Federal Reserve Board follow, compared with the same items at the time of greatest expansion:

#### COMBINED FEDERAL RESERVE BANKS

(In millions of dollars)

	MAXIMUM		October 26, 1921	Percentage change
	Amount	Date (1920)		
Total earning assets .....	3,422	Oct. 15	1,562	-54.4
Total bills on hand .....	3,127	Nov. 5	1,371	-56.2
F. R. notes in actual circulation .....	3,405	Dec. 23	2,409	-29.3
	MINIMUM			
Reserve ratio .....	42.2%	May 14	70.8 *	....
Excess reserves .....	201	May 14	1,365	....

#### REPORTING MEMBER BANKS

(In millions of dollars)

	MAXIMUM		October 19, 1921	Percentage change
	Amount	Date (1920)		
Loans and investments † .....	17,284	Oct. 15	11,477	-33.6
Aggregate deposits .....	14,600	Jan. 16	13,350	- 8.6
Bills payable and bills rediscounted with F. R. banks .	2,278	Nov. 5	829	-63.6
Ratio of accommodations at F. R. banks to loans and investments .....	13.5%	Nov. 5	5.6	....

\* Computed on revised basis.

† Including bills rediscounted with federal reserve bank.

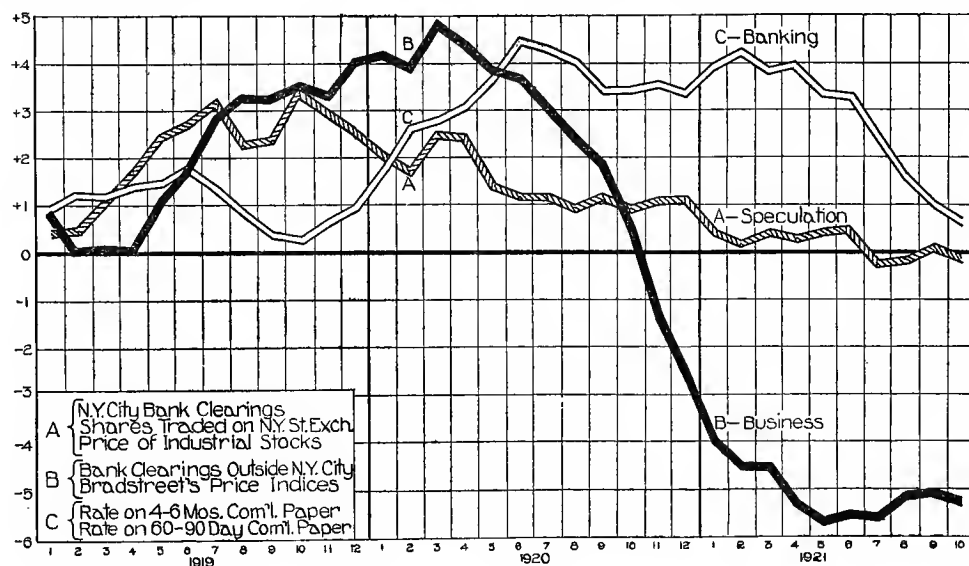
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# GENERAL BUSINESS CONDITIONS

*Advance Letter — November 15, 1921*

## THE INDEX

THE improvement of business last month has been somewhat less than the usual seasonal amount. This is shown by the slight decline in October of curve B of our index chart, representing business. The movement of our curve during the last three months has thus been sidewise. The decline in October was due to the fact that outside bank clearings did not show the usual seasonal advance. They rose from 13,210 to 14,240 millions of dollars, a gain of 8 per cent, against a usual increase of twice as much. During the preceding



month, although increased by the September payments of the income tax, they had shown only the usual seasonal advance. October figures, since they are compared with those of a month of income tax payments, naturally show a less than seasonal increase. To this result, undoubtedly, another factor, namely, the threat of a railroad strike, contributed. The importance of this disturbing factor is uncertain. Probably we must have the November figures before we undertake to decide how far the volume of business this fall has risen above or fallen below the usual seasonal increase. Bradstreet's index of commodity prices on November 1 stood at \$11.35, or 1.4 per cent higher than on October 1. This slight increase was not sufficient to offset the small figure for outside bank clearings. Marked changes in commodity prices were increases in provisions and textiles, and a decrease in breadstuffs. Of the 106 commodities quoted 32 advanced, 27 declined, and 47 remained unchanged.

The failure of business to show decided improvement since the trough of the depression last May is not unexpected. A sidewise movement or halting improvement of business was

indicated early in the year by the course of curve C, representing banking. In January we stated that, "If we are to have a marked revival in business, we must first have a considerable decline in rates on commercial paper; and unless low rates continue for a year or more a revival in business can scarcely develop into a boom." It is only since July that curve C, representing interest rates on commercial paper, has shown a pronounced decline, and at present the evidence indicates that the downward movement will continue. The recent issue of treasury certificates bearing interest at  $4\frac{1}{4}$  and  $4\frac{1}{2}$  per cent, rates well below those of previous issues and of other securities on the market, were greatly oversubscribed. During the first week of November, the rediscount rates of the federal reserve system were lowered throughout the country. The decreases amounted to 1 per cent in some districts and  $\frac{1}{2}$  per cent in others. All these factors are evidence of the easier money conditions, which favor continued improvement in business.

The reduction of rediscount rates by the federal reserve system has followed the building up of cash reserves and general liquidation of loans, although the latter movement has not been marked in the predominantly country districts. The position of the federal reserve banks in these districts, however, has recently shown some improvement. Under such conditions, and with business and agricultural interests urging the reduction of rediscount rates, the action taken seems inevitable. The lowering of rediscount rates was immediately followed by reduction of commercial paper rates on the New York market. There can be no doubt that lower interest rates will have a stimulating effect on general business conditions; that effect is already evident in the present strong and active bond market.

### SPECULATION

Security prices, trading on the New York Stock Exchange, and New York clearings reflected somewhat increased speculative activity in the first two weeks of November. Since the middle of October, when both stock and bond prices slumped, their upward movement has been pronounced. Recently the bond market has displayed undeniable strength. The Dow-Jones average of the prices of 40 bonds rose from \$78.77 on October 18 to \$81.21 on November 12, the highest point touched in more than two and a half years. The average price for October as a whole, however, was lower than for September. Railroad and industrial stock prices made even greater percentage gains than bond prices, from \$70.00 and \$69.46, respectively, on October 17 to \$73.58 and \$75.75 on November 9. On October 28, following the news that railroad strike orders had been withdrawn, the number of shares traded on the New York Stock Exchange exceeded 1,000,000, for the first time in over four months. Since then the daily average has been 600,000 shares.

### BUSINESS

The most important advance during October is shown by the production statistics of iron, steel, and coal. Steel ingot production rose 38 per cent, pig iron 26 per cent, and bituminous coal 25 per cent. Forty-three per cent more pig iron was produced in October than the low total reached in July. Ninety-six furnaces were in blast on November 1, as against 82 on this date the month previous.

Price advance during the month has been slight, and in two important commodities — wheat and cotton — there has been some recession from the highest point of September.



The daily price of wheat during October has been well below the average for the preceding month, and lower during the last two weeks than in the first two. A low of 99½ cents per bushel for December futures was reached on November 3 in the Chicago market. Cotton prices have likewise shown a tendency to decline. The spot price of middling upland on the New York market reached a low for the month of 18.5 cents on the eighteenth; it has not exceeded 20 cents since the eighth.

Reports on the liquidation of farm loans are not favorable, although there has been a marked strengthening of the position of the federal reserve banks in the predominantly agricultural districts. Congestion of wheat storage facilities is reported from many wheat collecting centers, and some grain has been reshipped from Montreal and New Orleans to the Central West. The further decreases which have taken place in the prices of certain farm products mean further curtailment of the farmers' purchasing power, and hence of the market for manufactured articles in the country. *The London Grain Reporter's* estimate of the world wheat crop is somewhat larger than last year, although European production is reported to be considerably smaller.

### BANKING

The most striking recent development in the field of banking has been the general reduction of the rediscount rates of the federal reserve system. On November 2, reductions were announced by the federal reserve banks of New York, Philadelphia, St. Louis, Chicago, Kansas City, San Francisco, Richmond, and Atlanta, followed, on November 3, by the federal reserve banks of Boston and Dallas, and on November 4 by those of Cleveland and Minneapolis. It is significant that during the same week the Bank of England reduced its rate from 5½ to 5 per cent. Present and previous federal reserve rediscount rates are as follows:

(Unit: one per cent)

District	Present rate	Previous rate	District	Present rate	Previous rate	District	Present rate	Previous rate
Boston .....	4½	5	Richmond .....	5½	6	Minneapolis ....	5½	6
New York .....	4½	5	Atlanta .....	5½	6	Kansas City ....	5	6
Philadelphia ....	4½	5	Chicago .....	5	6	Dallas .....	5½	6
Cleveland .....	5	5½	St. Louis .....	5	6*	San Francisco ...	5	5½

\* Bankers' acceptances, 5½ per cent.

The 4½ and 5 per cent rediscount rates, at least, are well below recent open market rates on short time paper. For October rates at New York averaged 5.94 per cent on 4-6 months commercial paper, and 5.62 per cent on 60-90 day paper. These rates represent a slight decrease from the previous month, and a continuous decline during the past year for 60-90 day paper and during 14 months for 4-6 months paper. During the week ending November 4 rates on the earlier maturities ranged from 5 to 5½ per cent, ½ of one per cent lower than in the preceding week, while rates on the later maturities stood at 5½ per cent, ½ to ¼ of one per cent lower. During the same week, the New York call loan rates varied from 4½ to 6 per cent.

The United States Treasury certificates of indebtedness dated November 1 were heavily oversubscribed, the allotments amounting, in all, to less than one-third of the total subscrip-

tion. In view of the low rate at which the certificates were issued —  $4\frac{1}{4}$  and  $4\frac{1}{2}$  per cent — this result was remarkable. It indicates the extent to which funds are at present seeking investment in securities not involving risk. Subscriptions were principally from banks, though a good demand was reported on the part of corporations.

For many months there has been a steady increase in the gold reserve of the federal reserve system, a general reduction of loans by member banks at the central institutions, and an easing of money and credit conditions. The position of the federal reserve system, as a whole, has been steadily growing stronger as a result of these factors. The favorable development, however, has been "spotty," at least up to recent weeks. The position of the reserve banks in the predominantly city districts has shown the most marked and continuous improvement, while that of the reserve banks in the predominantly country districts has been much less favorable. Liquidation has been accomplished much less thoroughly in the country districts than in those dependent on manufacturing. Low prices for agricultural products, except for cotton, have deterred such development, and the shortness of the cotton crop doubtless has been to some extent an unfavorable element in the south. The reserve ratios of the various banks, therefore, show wide divergences.

At present, the New York and Boston reserve banks have the highest adjusted reserve ratio<sup>1</sup> — over 80 per cent in each case. During the past six months the reserve ratio of these banks has increased fairly continuously, and that of New York rapidly, while at the same time the Chicago and San Francisco ratios have likewise shown a steady improvement, though one which has not been so rapid. The Philadelphia and Cleveland ratios reached the lowest point in the last half-year on June 1 and 15, respectively, and have been higher since. None of these six banks has shown a reserve ratio of less than 50 per cent since May 1. Of the remaining six banks, four — Atlanta, Richmond, Minneapolis, and Dallas — show a pronounced decline from May to August. The last two reached low points for these months on August 24 and 31, respectively. The ratio of the Richmond bank reached its lowest for the last half-year on September 14, and that of the Atlanta bank on September 28. Each of these four banks has shown a recovery since the dates mentioned. That of the Dallas bank has been most pronounced. Its ratio rose from 9.2 per cent to 33.4 per cent on November 9. Minneapolis has increased from 22 per cent to 47.9 per cent, and Richmond from 26 to 41.4. The increase in the Atlanta ratio has been least. The ratio of the St. Louis bank has increased steadily since July 6, and is now 68 per cent. The Kansas City bank ratio moved up during the early summer, reaching a high point, for the last six months, of 60.8 per cent on August 24. It is the only bank showing a marked decrease since that date. The present ratio is 48.4 per cent.

On November 9 the reserve ratio of the combined federal reserve banks was 71.4 per cent, an increase over that of the preceding week. This increase was due to increased gold reserves and a decrease in total deposits, while federal reserve notes in actual circulation increased slightly.

<sup>1</sup> All the reserve ratios quoted for each of the twelve federal reserve banks are computed from "adjusted" figures. That is, the reserves of lending banks are increased, and of borrowing banks are decreased, respectively, by the amount lent or borrowed.

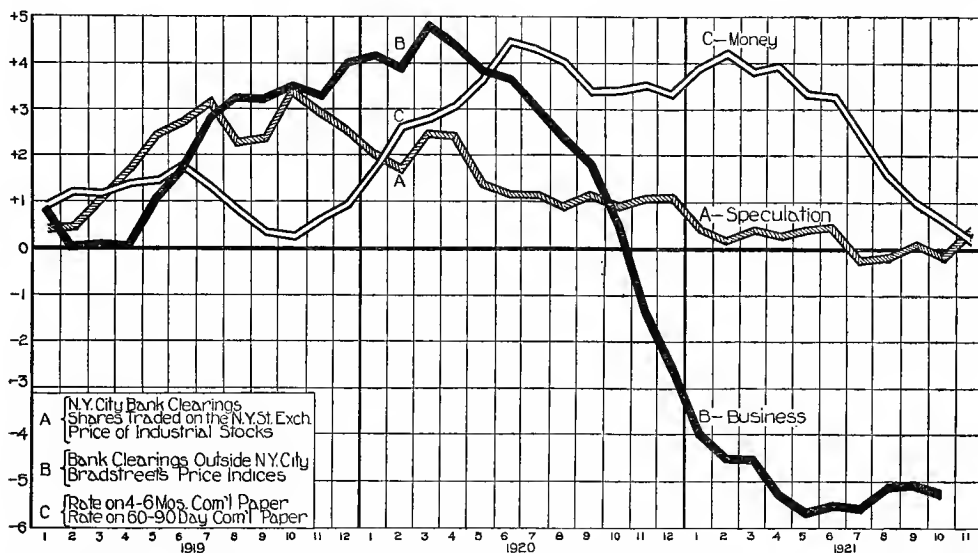
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# GENERAL BUSINESS CONDITIONS

*Advance Letter—December 1, 1921*

## THE INDEX CHART

**T**HE movements of the speculation and money curves of our index chart during November give indications more favorable to business advance than at any time during the past four months. Curve C, representing money, again moved downward, at about the same rapid rate that has been maintained since June. Such a decline usually precedes, and hence forecasts, a marked upward movement of curve A, representing speculation, and then a rise of curve B, representing business. This effect has now clearly shown itself in



**FORECAST:** Since June curve C, representing money, has moved downward sharply, reflecting decreased interest rates. A decline of curve C usually precedes, and hence forecasts, an upward movement of curve A, representing speculation, and then of curve B, representing business. Curve A has risen substantially in November, after three months of slow and halting recovery from the low point reached in July. This upward movement of curve A shows, for the first time in a significant fashion, the expected result of easier money conditions, evidenced by the decline in curve C. The movement of these two curves forecasts a significant rise of curve B, representing business, which has been recovering very slowly from the depth of the depression reached last May.

curve A. The latter moved upward during the month to a position higher than it has held during the preceding four months. The advance during November has been substantial, after three months of slow and halting improvement from the low point reached in July. Although a rise of curve A for two consecutive months would give greater assurance of the permanence of the improvement shown, the present upward movement is significant, because certain conditions conducive to speculative activity are now present. Interest rates have decreased, bond prices have risen since the end of June, and the investment market is now strong and active. On the index chart we find that the curve representing speculation has moved sharply upward and has crossed the curve representing money,

which is sharply falling. Such a movement of the two curves normally precedes an active stock market. Their present relation is just the reverse of that which obtained in January 1920 when curve C, rising abruptly, crossed curve A, which was declining rapidly from the high level of the previous year; and this changed relation expresses very accurately and strikingly the difference between the business conditions existing at the two dates.<sup>1</sup>

## SPECULATION

Security prices have shown a substantial and steady increase since the slump in the middle of October. The Dow-Jones index of the price of 40 bonds rose from \$78.77 on October 18 to \$84.04 on November 29, an advance of 6.7 per cent. The advance during November has been largest for railroad bonds, but public utilities and industrials each gained over 4 per cent from the first to the twenty-ninth. Industrial and railroad stock prices have shown an advance similar to bond prices. The Dow-Jones index of the price of 20 industrials increased from \$69.46 on October 17 to \$78.01 on November 28, and the price of 20 railroad stocks from \$70.00 to \$76.06. The number of shares traded on the New York Stock Exchange daily in November has been well above the level of the first three weeks of October, and the total for the month, despite three holidays, is 18 per cent above that of the preceding month.

## BUSINESS

The railroad situation has been considerably clarified by the developments of the month, which gave promise of prompter and more sweeping readjustments than had been generally anticipated. On November 16 the Association of Railway Executives announced their plan for a temporary ten per cent reduction in freight rates on agricultural products. They also petitioned the Interstate Commerce Commission for a rehearing on the reduction of 20 per cent in the rates on hay and grain in western and intermountain territory, and asked for a general inquiry as to the further rate reductions which the Commission could require. The Commission has subsequently postponed the date on which the reduced hay and grain rates are to go into force from November 20 to December 27. On November 23, it announced that hearings would be held at its offices December 14 to determine "whether and to what extent, if any, further reductions in rates, fares and charges can lawfully be required by order or orders of the Commission . . . upon any commodities or descriptions of traffic." Obviously further readjustment of railroad rates involves consideration of the wage scale of the railroad employees. The threatened strike was averted apparently on the understanding that the United States Railroad Labor Board would give its attention to the revision of working rules before considering applications for wage reductions. The Board has drawn up working rules, which become effective December 1, for the six shop crafts. These include the carmen, sheet metal workers, machinists, blacksmiths, boiler-makers, and electricians; approximately 400,000 men are affected at present. The issuance of these rules paves the way for consideration of requests for changes in the wages of the shop crafts.

<sup>1</sup> All the series upon which curve A is based advanced during November. New York bank clearings were about 5 per cent above those for October; they are usually 5 to 6 per cent less. Shares traded on the New York Stock Exchange increased about 18 per cent, and the Dow-Jones index of the price of 20 industrial shares rose almost 7 per cent. The decline in curve C, representing money, was due to a substantial decrease in the rates on commercial paper, at a time when the decrease is usually slight.

Indications of business improvement during October continue to appear. Unemployment was generally less than in September. The value of the building permits issued in October exceeded that for any one month except April 1920. The gain over September was 25 per cent, the largest advance between these months since 1908. The increase was due to the large October total for New York City.

A strike of the garment workers in New York City has to some extent curtailed purchases of wool fabrics during the past two weeks. The percentage of idle spindles on November 1 amounted to 20 per cent of the woolen spindles and 8 of the worsted, a slight improvement over October 1. There has been a substantial recovery since spring in the carpet and rug looms in operation; the percentage of idle loom hours on November 1, however, was still almost one-third of the total reported.

Production in the iron and steel industry is holding up, although new business is apparently less than current output. Leaders in the industry have stated that the directly unfavorable effects of limitation of armaments on the trade would be overbalanced by the ultimate benefits to be derived. Serious readjustments would doubtless be required in plants specializing in armor plate and ordnance, but the tonnage of steel required for naval construction is only a fraction of one per cent of the yearly output of the industry as a whole. Railroad buying is a promising factor on the steel market; it includes rolling stock, track equipment, and rails. Prices have felt the effect of competition, arising from the desire of producers to keep up the rate of operation. Those for steel, as shown by the composite figure of the *Iron Age*, are still declining, while pig iron prices, though slightly below the level reached at the end of September, are well above the low of August. Fabricated structural steel contracts during October were at 54 per cent of rated capacity, the highest monthly percentage shown for the year. Exports of iron and steel were slightly greater than in September, though still less than one-third the amount shipped in the same month in 1920.

Copper prices advanced during November. Lead sales have been less than in October, but the decline is not as great as is usual at this time of year. Both lead and zinc prices have declined slightly at St. Louis, perhaps because a reduction of railroad rates on these metals is expected.

The situation in the country districts remains much the same. Buying has been restricted by the curtailed purchasing power of the farmer; even in the cotton area, despite the high level of prices, there seems to be little increase in purchases. Cotton prices declined during the first two weeks of November; the spot price of middling upland on the New York market reached 17 cents per pound on the fourteenth, the lowest since August 31. Exports during October were 874,510 bales, 67 per cent larger than in September. Wheat prices have recovered somewhat since the low reached during the first week of the month. Wheat exports fell from 30.8 million bushels in September to 18.4 millions in October.

## MONEY

Evidences of easier money conditions continue to come to sight. The fact that large funds are seeking investment is shown by the size of subscriptions to investment securities of the best class. The last three issues of United States treasury certificates of indebtedness amounted to 1,100 million dollars, while the subscriptions were over three times as large. Subscriptions to the recent issue of 6 per cent refunding mortgage bonds of the New York Telephone Company were nearly ten times the amount offered — \$50,000,000. Although

the importance of such oversubscriptions is to be discounted because the bids were padded to gain advantage in the expected allotment, nevertheless they show a real demand of remarkable size. In the case of the telephone bonds, the large number of separate subscriptions supports this conclusion.

The position of the federal reserve system has continued to grow stronger during the month. The reserve ratio of the combined reserve banks rose from 71 per cent on November 2 to 72.3 per cent on November 23. Reserves have increased steadily, while federal reserve notes in actual circulation and total deposits have decreased. There has been a slight expansion, since August, of the aggregate deposits of reporting member banks.

Interest rates on commercial paper have decreased during the month; the current rate is 5 to 5½ per cent. Call loan rates have ranged between 4 and 6 per cent; at present they are 4½ per cent.

## SUMMARY

The growth of investment funds (despite the lack of business profits), decreased interest rates, and higher prices for investment securities are natural at this stage of the business cycle. We are just beginning to emerge from a condition of profound business depression. Prices have fallen abruptly, bank loans have been to a large extent liquidated, and note circulation has been greatly curtailed. The position of the banks has been greatly strengthened, not only by these last two factors, but also by the accumulation of gold in the bank reserves of the United States, because of the large excess of gold imports over gold exports. Business, now at a low ebb as to production and with prices greatly decreased, does not absorb the funds previously needed for current operation. The surplus funds of the banks and of business interests have thus expanded, and are now seeking investment. Speculation and investment in industrial stocks have been deterred by the small profits to be realized from industry; hence these funds have found an outlet in government securities and bonds, rather than seeking investment in stocks or being used for speculation. With further accumulation of funds, however, the narrowness of such outlets, the decreasing return to be gained, and the attractiveness of low stock prices, tend to bring more and more money into the stock market. The increase in stock prices and activity on the New York Stock Exchange during November is the first tangible evidence that easier money conditions are having their expected result.

Two other factors, less immediate in their effects than those just discussed, are favorable to future business development. Recent action of the Interstate Commerce Commission and Railroad Labor Board points toward a not too remote readjustment of railroad rates and wages. In the second place, the proposal for the limitation of naval armaments made by the United States gives promise of a curtailment of governmental expense. Such curtailment in the United States would lift a portion of the burden of governmental expenditure from American industry. For Europe as a whole the lightening of the burden of armament would mean more rapid recovery, which would react favorably upon the economic situation here. Beyond these merely material results, the improvement in international relationships expected from the conference will go far to allay international distrust and restore confidence.

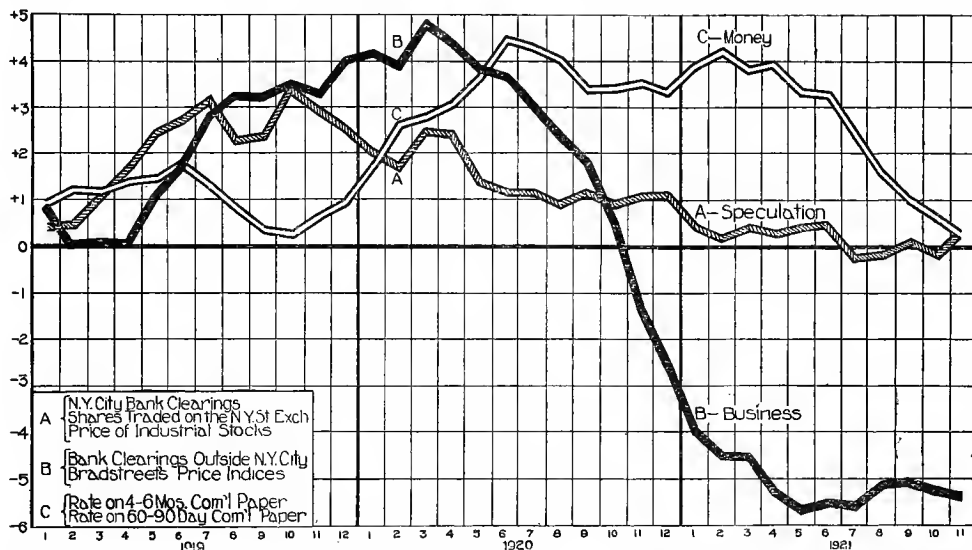
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# GENERAL BUSINESS CONDITIONS

*Advance Letter—December 15, 1921*

## THE INDEX CHART

**B**USINESS activity and wholesale commodity prices receded slightly in November, as is evidenced by the downward movement of curve B of our index chart, representing business. The decline was due to a decrease in both series upon which the curve is based: Bradstreet's price index fell slightly, from \$11.35 on November 1 to \$11.31 on December 1, while bank clearings outside New York City were 4 per cent less in November than October, as against a usual decline of only 2 per cent. But although the gains of the early fall have



**FORECAST:** Since June curve C, representing money, has moved downward sharply, reflecting decreased interest rates. A decline of curve C usually precedes, and hence forecasts, an upward movement of curve A, representing speculation, and then of curve B, representing business. Curve A has risen substantially in November, after three months of slow and halting recovery from the low point reached in July. This upward movement of curve A shows, for the first time in a significant fashion, the expected result of easier money conditions, evidenced by the decline in curve C. The movement of these two curves forecasts a significant rise of curve B, representing business, which is now above the level reached in the depth of the depression last May.

not been fully maintained, nevertheless the level of the last month was above that of the early summer. The increases which have taken place in prices since the low level are chiefly responsible for maintaining curve B at its present height. Conditions for an immediate upward movement of business are not yet present; but a continuance of the upward movement of curve A, representing speculation, which became pronounced during November, and the expected persistence of easier money conditions, represented by curve C, mean a significant improvement in business conditions in the spring of 1922.



## BUSINESS

Now that statistics reflecting business conditions are available for November, it is possible to judge the extent of the economic improvement which we have witnessed this fall. The general indices of business activity show that the increase in business activity during the fall was less than the seasonal amount. Bank clearings outside of New York City, the most reliable of such indices, increased 3 per cent in September, 8 per cent in October, and fell off 4 per cent in November, as against usual increases of 3 and 16 per cent in the first two months and a decline of 2 per cent in the last.<sup>1</sup> The statistics for business failures show the same condition, since the increase of such failures in October and November has been somewhat greater than usual. The increase in car loadings from midsummer until the end of October was about that seasonally expected, as has been the decrease since.<sup>2</sup> On the other hand, building activity and the volume of manufacture for certain industries have shown a more than seasonal improvement. Conspicuous among the latter are the iron and steel and paper industries. The advance in the textile industries through October is about that to be expected at this time. No significant improvement has appeared in the lumber and leather industries, and the production of petroleum has fallen off slightly.

Despite apparent progress towards price stabilization, shown by a decreasing number of price changes week by week, one of the most potent factors in delaying business advance has been the expectation of further price reductions. Adjustments in railroad rates and the anticipation of further adjustments have played an important part in the uncertainty of prices. Perhaps the most disturbing of price fluctuations — unconnected, in this case, with railroad rates — has been that in the price of cotton. The phenomenal advance in August and September was followed by a somewhat irregular recession, which brought the spot price of middling upland on the New York market to 16.7 cents per pound on November 12. A price of 18.9 cents was reached on the twenty-third, and this has not been exceeded since. One reason for lower prices is found in the governmental ginning figures, which show that 7,641,000 bales of this year's crop have already passed through the gins, while the October crop estimate was only 6,537,000 bales. The violent fluctuation in the price of this raw material has had the effect of slowing down the distribution of cotton goods because of the uncertainty it has created as to their future price.

Most of the movements of the indices of commodity prices in the United States and European countries have been slight and irregular during recent months. The accompanying table presents price indices for the United States and important foreign countries since May 1921. The minimum figure of each series is in boldface type. Prior to May there occurred an almost continuous decline from the high points reached in 1920 for all the countries except Germany. For the United States, the decline in prices was steady from the first half of 1920; the low point of the decline appears to have been reached in the three months June–August. There has been an advance since, but it has been irregular and not large.

Until fall the movement of wholesale prices in most foreign countries was similar to that which occurred in the United States. Canada, indeed, had shown an uninterrupted decline

<sup>1</sup> If the 1921 figures are corrected for income tax payment the September increase practically disappears, while that of October becomes approximately 11 instead of 8 per cent.

<sup>2</sup> During the week of July 9, a holiday week, car loadings reached a midsummer minimum of 639,698 cars, **rising to 776,252 cars** the next week. They increased fairly continuously to the week of October 22, when 962,698 cars were loaded, dropped to 952,621 the following week, and numbered 786,671 on the week of November 19.

# WHOLESALE PRICE INDEX NUMBERS OF SELECTED COUNTRIES

(Average for 1913 = 100)

	United States				Canada	United Kingdom		France	Italy	Germany <i>f</i>	Netherlands	Sweden	Norway <i>g</i>	Denmark <i>h</i>	Japan
	U. S. B. L. S.	Brad-street's	Dun's	10-commodity price index		Economist	Statist								
1921	<i>a</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>i</i>	<i>c</i>	<i>d</i>	<i>b</i>	<i>d</i>
May .....	151	117	141	111	183	182	191	330	547	1428	182	218	294	257	191
June .....	148	115	140	113	179	179	183	325	509	1387	182	218	294	254	192
July .....	148	117	135	109	176	178	186	331	520	1467	176	211	300	253	196
August ...	152	120	138	107	174	179	183	332	542	1723	180	198	297	254	199
September	152	120	137	111	172	183	176	345	580	1777	180	182	287	224	207
October ..	150	122	136	119	169	170	163	333	599	1993	169	175	286	202	...
November	...	123	138	118	...	...	...	...	...	2687	...	...	276	186	...
December	...	123	139	112	...	...	...	...	...	3283	...	...	...	...	...
Month in which maximum was reached <i>e</i>	May 1920	Feb. 1920	May 1920	June 1920	May 1920	Mar. 1920	Apr. 1920	Apr. 1920	Nov. 1920	Dec. 1921	July 1920	June 1920	Sept. 1920	Nov. 1920	Mar. 1920

*a.* Average for month. *b.* First of month. *c.* Middle of month. *d.* End of month.

*e.* The decline was continuous from the month in which the highest number was recorded except for Germany, and minor fluctuations in the indices of the *Economist* (United Kingdom) and of France and Sweden.

*f.* July 1914 = 100. *g.* December 31, 1913-June 30, 1914 = 100. *h.* July 1, 1912-June 30, 1914 = 100.

*i.* Not stated whether average for month, or representing prices for one day.

of commodity prices, also had Sweden; but elsewhere there were evidences of approximate price stabilization, with some tendency toward a recovery from the low points reached last spring. In September, however, the indices for Norway and Denmark showed a substantial decline, and in October recessions occurred in the United Kingdom, France, and the Netherlands. Italy and Japan were not involved in this downward movement, the extent and significance of which it is not now possible to appraise. Obviously the renewal of liquidation in commodity markets reflects and tends to accentuate the slow recovery of Europe from the depression which began last year.

Wool consumption continues to gain. In retailing ready-to-wear garments, special sales have appeared earlier than usual, and have in many instances involved substantial price reductions. The strike of the garment workers in New York continues; a similar strike began in Philadelphia on November 28, and in Chicago during the same week. Coincident with the willingness of consumers to pay the prices asked for woollen goods there has occurred a steady advance in the price of raw wool. The market has been active, and has even been characterized as "speculative." The price of fine wools has been affected by the emergency tariff, and a growing scarcity of these wools is reported. At a recent auction of government wool, the entire amount was disposed of at price advances of from 10 to 15 per cent. The London market has shown a price decline of 5 to 15 per cent, due, it is said, to lack of American buying. This has acted to place the American manufacturer of wool at a disadvantage compared with the British.

In the iron and steel industry the gain made in production during September and October has not only been held, but an additional advance recorded; our adjusted index of physical production, from which increases due to seasonal influences have been removed,

stood at 37.0, 44.2, and 53.6,<sup>1</sup> for each of the last three months. The number of furnaces in blast rose from 96 on November 1 to 120 on December 1. A merger of seven of the independent steel companies is being contemplated. Steel prices, according to the index of the *Iron Age*, are slightly higher than in the third week of November; pig iron prices have fallen off somewhat since the middle of that month.

There has been a fairly continuous increase in the price of wheat from the low of November 3. This has had less effect upon the prosperity of the country districts because this year's crop was largely marketed. Liquidation in the agricultural districts apparently stopped before substantial gains had been made, and at least one more crop year will be needed to lift appreciably the load of indebtedness from farming communities. The War Finance Corporation has been active in meeting the demand of farmers and stock raisers for longer time credit than that ordinarily furnished by the banks. Loans made by this body from January to November exceed \$119,000,000. These have been used partly to assist export trade. Loans through the Stock Growers' Finance Corporation to stock raisers are reported to have prevented the sale of immature cattle and the depletion of herds. The Federal Reserve Bank of Chicago states that dairy farming has felt the depression less severely than other branches of agriculture, and that recovery in this line has been correspondingly more rapid.

### SPECULATION

Except for industrial stocks, the advance in security prices came to a temporary halt in the first two weeks of this month. The Dow-Jones daily average prices of 20 industrials, though somewhat irregular from day to day, advanced to \$80.69 on December 13, the highest point reached in more than a year. Railroad stock prices, on the contrary, though still well above the October low of \$70.00, moved downward from \$76.66 on November 29 to \$74.21 on December 13. Railroad bonds, like railroad stocks, declined in price, while industrial bonds were firm and public utilities advanced. Thus, the average of 40 issues was maintained between \$84.00 and \$84.13 during the first week of the month, but has fallen off since. Although security prices as a whole have done no more than hold their ground during these two weeks, their level is high in comparison with recent months. The volume of shares traded has decreased since the first week of December, and New York bank clearings have tended so far this month to decline rather than increase.

### MONEY

The easier money conditions evident in November have continued into December. Interest rates on commercial paper have remained unchanged at 5 to 5½ per cent. Call loan rates have fluctuated between 4½ and 6 per cent; they are now 5 per cent. The reserve ratio of the federal reserve system has again risen, despite an increase of federal reserve notes in actual circulation during the first week in December. A slight expansion in banking activity, however, is shown by the fact that loans and investments and aggregate deposits of reporting member banks reached a minimum in October and August, respectively.

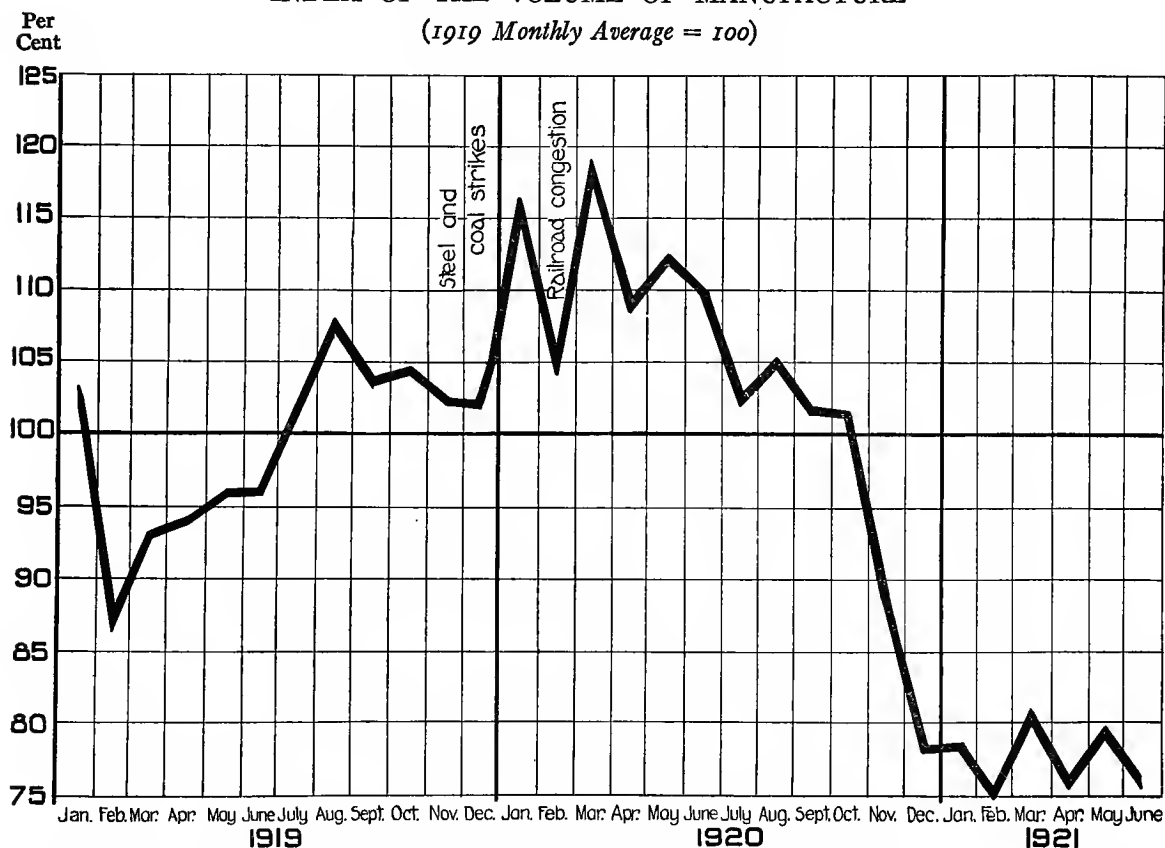
<sup>1</sup> Provisional.

HARVARD UNIVERSITY  
COMMITTEE ON ECONOMIC RESEARCH  
**THE VOLUME OF MANUFACTURE**

*Special Letter — September 20, 1921*

**F**LUCTUATIONS in the volume of production constitute one of the most significant elements of the business cycle. Outwardly the cycle is a matter of markets and demand, of prices and profits. But behind these forces lie such factors as raw material supplies, producers' stocks, employment conditions, manufacturing output. The variations of these

INDEX OF THE VOLUME OF MANUFACTURE  
(1919 Monthly Average = 100)



underlying factors reflect critical processes of industrial adjustment. In the development of crisis conditions as well as in the restoration of normal trade, changes in the volume of production are fundamental.

Accurate measurement of these variations is essential to a full understanding of industrial conditions. The precise character of the fluctuations, their period and amplitude, and the striking contrasts among the several more important industrial groups, must be ascertained. An index of the physical volume of manufacture, for groups of industries and for the groups combined, will throw needed light upon the course of the business cycle.

Such an index, for the several manufacturing groups combined, appears above.

The index registers definitively the cycle through which manufacturing activity has passed in the United States since the beginning of 1919. The opening months of that year witnessed the industrial sag started by the armistice. Spring brought a recovery, and summer an acceleration, of output. The steel strike, beginning in late September and last-

TABLE A. — MONTHLY INDICES OF THE VOLUME OF MANUFACTURE FOR EIGHT GROUPS OF MANUFACTURING INDUSTRIES AND FOR THE GROUPS COMBINED

(1919 Monthly Average = 100)

Month	All groups	Iron and steel	Lumber	Paper	Petroleum	Textiles	Leather	Food	Tobacco
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1919 January....	101.6	130.1	75.5	93.0	89.7	96.5	....	114.9	87.3
February ..	86.7	113.7	75.8	82.8	83.8	72.7	....	87.3	83.8
March.....	92.6	113.5	88.8	87.0	92.8	79.0	....	92.1	97.7
April.....	93.7	94.6	97.8	88.4	92.4	92.9	....	92.8	82.0
May .....	95.7	81.2	112.1	95.1	100.7	99.2	....	98.5	88.0
June .....	95.9	90.9	103.5	98.3	96.1	100.2	....	83.8	92.9
July.....	101.9	103.1	103.7	103.3	103.7	109.4	....	85.9	99.3
August ....	107.2	113.5	123.4	108.8	107.4	103.4	....	88.4	101.1
September .	103.8	97.6	113.8	106.2	108.3	105.3	....	97.7	108.6
October....	104.4	73.2	123.4	116.4	112.0	119.3	....	111.2	125.4
November .	102.2	94.0	102.0	108.6	107.0	104.9	....	109.0	117.0
December..	102.1	103.4	80.1	109.8	107.6	110.1	....	108.6	113.0
1920 January ...	115.9	124.2	101.1	120.9	102.3	126.6	90.8	112.2	115.7
February ..	104.6	120.5	101.3	105.8	97.0	110.5	81.6	85.3	98.9
March.....	118.0	138.3	117.4	119.5	111.6	121.0	94.0	90.8	123.1
April.....	108.8	111.0	122.3	121.7	109.3	119.3	84.7	75.9	108.0
May .....	111.8	121.2	127.3	119.2	115.0	110.5	90.9	85.1	111.1
June .....	109.6	124.9	115.4	122.5	115.9	104.1	95.2	80.8	114.4
July.....	102.3	118.0	103.1	123.0	122.9	92.8	80.7	80.8	98.1
August ....	104.9	125.3	117.8	122.5	132.2	88.2	70.5	83.3	104.8
September .	101.4	125.0	108.7	119.3	134.6	83.4	73.3	78.0	104.9
October....	101.2	126.7	108.1	119.7	135.2	78.7	77.8	81.1	106.3
November .	88.9	111.3	86.2	108.0	131.2	62.1	70.1	91.0	93.1
December..	77.9	99.5	62.8	94.6	134.6	54.5	72.1	88.4	73.5
1921 January ...	78.3	92.7	59.5	84.3	131.6	68.1	63.5	84.1	88.7
February ..	75.0	73.7	65.3	78.5	115.0	76.3	62.8	74.4	95.0
March.....	80.6	65.2	78.2	83.2	117.9	89.3	72.0	85.6	106.6
April.....	75.8	50.5	84.6	79.3	124.9	89.3	75.8	82.4	96.6
May .....	79.3	52.4	100.7	73.6	122.8	96.2	83.2	79.9	100.6
June .....	75.9	42.3	93.3	75.6	122.7	100.8	81.1	82.7	108.0
July.....	...	34.0	....	71.0	....	89.5	....	82.3	....

ing into December, and the soft coal strike, from the first of November till the second week in December, seriously reduced the volume of manufacture. The railroad tie-up of mid-winter also impeded production. The peak of output came in March, 1920. There ensued a period of gradual decline, followed by a sharp slump in the fall. December, 1920, found

manufacture generally at a low level. It remained there during the first six months of the current year, unmistakable gains in some lines being offset by heavy losses in others.<sup>1</sup>

The index discloses clearly the extent, as well as the timing, of the fluctuations of manufacturing output since January, 1919. The slump following the armistice reduced production nearly 15 per cent below the 1919 average. The succeeding boom carried it 18 per cent above this average. The depression of recent months has been a more extreme movement. From January to June, production ran consistently between 20 and 25 per cent below the 1919 average, and in July probably fell over 30 per cent below.

These conclusions hold for the more important industrial groups combined, but the individual groups show striking deviations. An examination of these differences is highly instructive. Fortunately the method by which the general index is developed facilitates such an analysis. The index for all manufacture is a composite of indices registering the volume of production in eight groups of manufacturing industries. In three instances the group index rests upon a single series showing production of an important commodity month by month. In other cases, the group indices are based upon as many as four or five series. The several groups, designated by their basic products, together with the supporting series and the sources from which these have been drawn, appear in the following table:

TABLE B. — MONTHLY SERIES INDICATIVE OF THE VOLUME OF MANUFACTURE

Group	Series	Source
Iron and steel. . . . .	Pig iron produced	Iron Age *
	Steel ingots produced	" " *
Lumber. . . . .	Lumber cut (5 varieties)	Bulletin, Fed. Reserve Board *
Paper. . . . .	Newsprint produced	Monthly Report, Fed. Trade Comm.*
	Book paper produced	" " " " " *
	Fine paper produced	" " " " " "
	Wrapping paper produced	" " " " " *
	Paper board produced	" " " " " "
Leather. . . . .	Sole leather produced	Monthly Survey, Dept. of Comm.*
Petroleum. . . . .	Crude oil run	Monthly Report, Bureau of Mines *
Textiles. . . . .	Cotton consumed	Bulletin, Dept. of Comm.*
	Wool consumed	Market Reporter, Dept. of Agric.*
Food. . . . .	Wheat flour produced	Bulletin, Fed. Reserve Board *
	Cattle slaughtered	Market Reporter, Dept. of Agric.*
	Hogs slaughtered	" " " " " *
	Cane sugar melted	Bulletin, Fed. Reserve Board *
Tobacco. . . . .	Cigars produced	Monthly Report, U. S. Int. Rev.*
	Cigarettes produced	" " " " " *
	Manuf. tobacco produced	" " " " " *

\* Reprinted in "Current Statistics."

. . . . . <sup>1</sup> While the data for July are not yet complete, the month will probably show the lowest figure yet recorded — distinctly below 70. At the time of writing, however, the turn toward generally increased production seems to have been definitely made.

The group indices exhibit striking differences, at once apparent upon an examination of Table A and the diagrams on the next page.

The *general course* of the individual group indices is first to be observed. Iron and steel, the textiles, lumber, paper, all show marked cyclical movements. The tobacco group shows a clear cycle of lesser degree. While there is an apparent cycle in the leather index, it is obscured by the early slump of the industry, its sustained decline through many months, and its sluggish response to the somewhat more favorable conditions which have prevailed recently. The food index displays no clear cyclical movement, the large output of late 1919 being followed by several months of production upon an essentially even level. The petroleum trade likewise exhibits no distinct period. The strong upward movement of the industry has only recently been weakened by the pervasive influences of business depression. Undoubtedly all the groups are affected in some measure by the general business cycle. It is clear, however, that the extent to which they individually contribute to the cycle varies substantially.

One aspect in which the group indices differ widely is the *range* of their variation. Of course the petroleum index is in a class by itself, supported throughout by an extraordinary development of the sources of raw material. But excluding petroleum, marked contrasts remain. Thus the food index neither rises as high nor falls as low as the others. Compared with the rest, the group seems essentially phlegmatic. At the other extreme stands the iron and steel trade. It attained to relatively the greatest heights in 1920; it has recently fallen to the lowest depths. Despite every attempt to regularize the industry, it remains the most sensitive of all.

Between the food group at one extreme and iron and steel at the other, the several other groups are scattered. The textile, lumber, and paper groups exhibit comparatively wide variations; the tobacco group fluctuates within narrower limits. Leather appears to occupy an intermediate position.<sup>1</sup>

Perhaps the most interesting variation of the group indices is in the *timing* of their significant movements. Thus the leather group was the first to experience the larger cyclical reaction after passing the post-armistice sag.<sup>2</sup> As early as November–December, 1919, production in this group was receding.<sup>3</sup> The food group followed suit almost immediately.<sup>4</sup> Textiles broke in May. Upon the other hand, the most important group of all, iron and steel, after a temporary relapse in April, ran production upon a high level until October, 1920. The paper group likewise suffered no marked decline until November. And the petroleum trade did not show weakness until mid-winter.

Similar differences appear in the periods at which the several groups of industries reached and passed the trough of the prevailing depression. The textile, lumber, leather, and tobacco groups apparently touched bottom between last December and February. All of these except leather have since returned nearly, if not fully, to the average level of 1919. The petroleum trade showed production well above the 1919 average even after its mid-winter

<sup>1</sup> It should not be forgotten that the variation of the group indices may be due in part to seasonal influences. No attempt has been made in the present study to correct for this factor. In a forthcoming issue, adjustments will be introduced for both seasonal variations and long-time trends.

<sup>2</sup> The boot and shoe industry was one of the first to show acute distress.

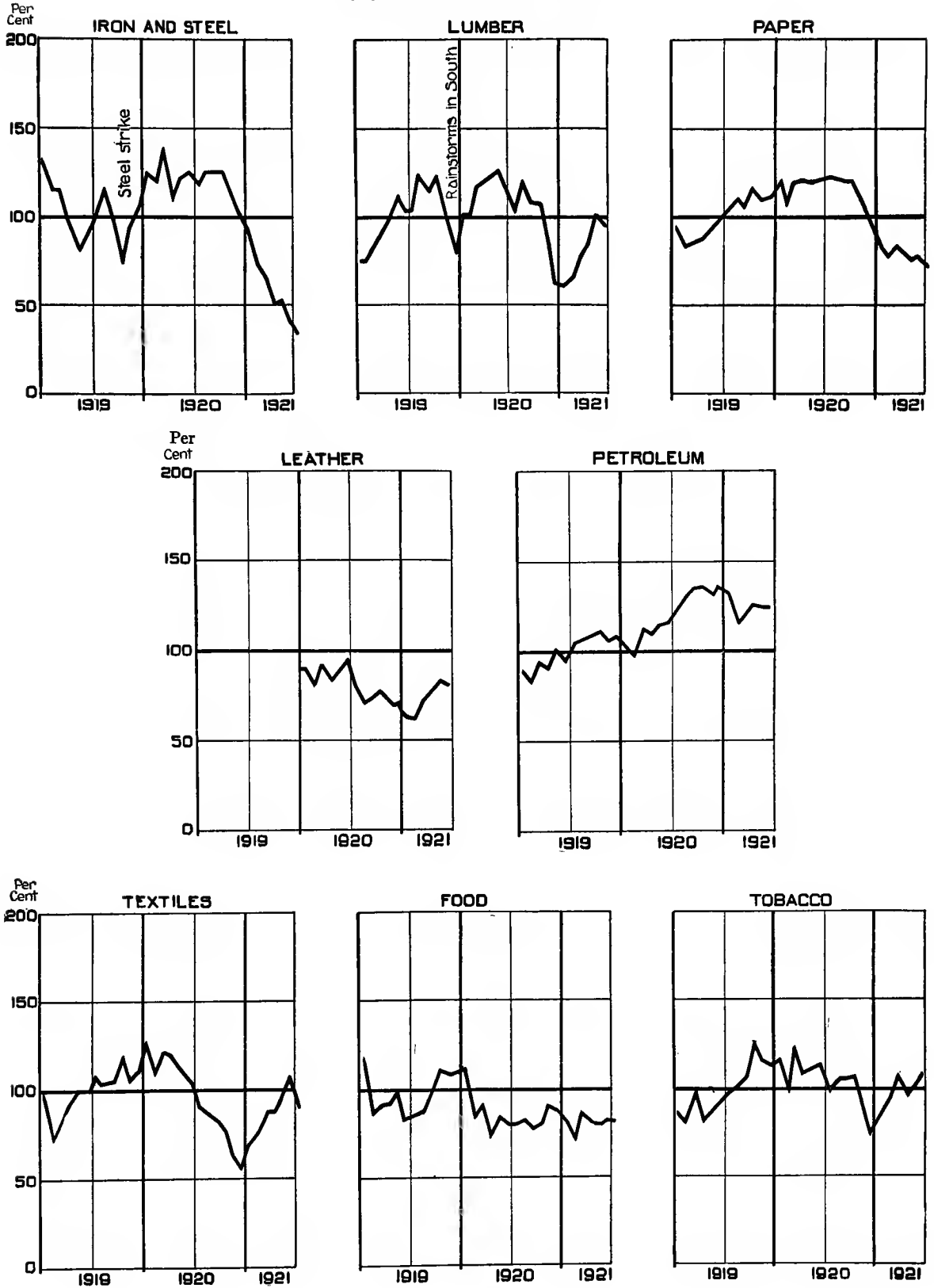
<sup>3</sup> This appears clearly from data on hand not available for publication.

<sup>4</sup> This was undoubtedly partly because of seasonal influences and the impossibility of maintaining for long the extraordinary food output of the closing months of 1919.



# INDICES OF THE VOLUME OF MANUFACTURE IN EIGHT IMPORTANT GROUPS OF MANUFACTURING INDUSTRIES

(1919 Monthly Average = 100)



weakness. Only iron and steel and paper, the last two to decline, failed to turn the corner toward recovery during the first six months of the year.

Of the many noteworthy contrasts suggested by these differences, perhaps none is so significant as that between the two fundamental groups, iron and steel upon the one hand, and textiles upon the other. Since January, 1919, the movements of textile production have consistently anticipated those of iron and steel. Textile output started upward in March, 1919; iron and steel, in June. The slump in textiles began in May, 1920; that in iron and steel in November. In 1921, textiles showed increased production as early as January; only during the most recent weeks has the iron and steel trade shown improvement. This apparent relationship is of great interest. It invites most careful study in later fluctuations of manufacturing output.

Distinct as are the differences of variation in output among the several industrial groups, a general movement in manufacture as a whole is discernible. Under the stimulus of rising prices, manufacturers resort to every available means for increasing output. Production rises to a maximum — as in the second half of 1919. But the effort to enlarge output encounters increasing difficulties, and production falls continually short of demand. "Underproduction" is the cry of the hour. Then the crisis breaks. Orders are cancelled, stocks accumulate, even customary output cannot be marketed. Production falls to a minimum — as in the first half of 1921. Against industrial management is laid the charge of previous "overproduction." Only when stocks have been exhausted and prices again stabilized, do the accumulations of demand restore confidence and lead once more to increased manufacturing activity. The cycle of production is undeniable; it has already shown its many phases in the United States since January, 1919. Its influence is fundamental. There is urgent need for more accurate and complete knowledge of its character and course. The Index of the Volume of Manufacture is a means to this better industrial diagnosis.

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### *Note on Methods Employed*

The methods employed in constructing the monthly Index of the Volume of Manufacture are essentially those developed in the derivation of the annual unadjusted index of the physical volume of production.<sup>1</sup> That index was set up as a weighted geometric mean of relatives obtained by referring the items of each series to a fixed base. The base adopted for the monthly index is the monthly average of 1919. The first step in the construction of the index is the reduction of the monthly items of each series to percentages of the series' 1919 average. These percentage relatives have been computed, for the months from January, 1919, to June, 1921, for all nineteen series upon which the general index is based.<sup>2</sup> The data will be given in a later publication.

The weighting of the different series of relatives is generally according to the values added by manufacture in the several industries and groups in the latest normal census year before

<sup>1</sup> See Review of Economic Statistics, Preliminary Vol. II, pp. 253-255, 309-325, 332-336.

<sup>2</sup> While the 1919 monthly items for leather are not available for publication, it has been possible to include leather in the general index from the start.

the war — 1909. Minor alterations of these weights have been made in the case of the tobacco group and the petroleum trade. The latter is manifestly of greater relative importance today than ten years ago. And within the tobacco group the production of cigarettes has shown an increase out of all proportion to the other tobacco products. These facts have been recognized in the adoption of the weights given in Table C.

TABLE C. — RELATIVE WEIGHTS EMPLOYED IN CALCULATING INDICES OF VOLUME OF MANUFACTURE

Series	For single industries	For groups of industries	For eight groups combined
Pig iron produced.....	.....	5.1	25.7
Steel ingots produced.....	.....	20.6	
Lumber cut.....	.....	.....	16.2
Newsprint produced.....	.....	3.4	13.6
Bookpaper produced.....	.....	3.4	
Fine paper produced.....	.....	1.7	
Wrapping paper produced.....	.....	3.4	
Paperboard produced.....	.....	1.7	
Sole leather produced.....	.....	.....	5.4
Crude oil run.....	.....	.....	4.1
Cotton consumed.....	.....	15.8	24.3
Wool consumed.....	.....	8.5	
Wheat flour produced.....	.....	5.2	13.5
Cattle slaughtered.....	3.45	6.9	
Hogs slaughtered.....	3.45		
Cane sugar melted.....	.....	1.4	
Cigars produced.....	.....	1.64	4.1
Cigarettes produced.....	.....	1.64	
Manufactured tobacco produced.....	.....	.82	

A general revision of the above weights is contemplated as soon as the 1919 census figures are available. There is no reason to believe, however, that this revision will appreciably affect the index.

The index presented above is of the “unadjusted” type — no allowances have been made for seasonal influences and long-time trends. In the index for the several groups combined, seasonal disturbances peculiar to the different lines of industry undoubtedly in some measure counterbalance one another. In the individual group indices, upon the other hand, the movements may be in considerable measure the result of such seasonal variations, combined with elements of normal growth. An analysis of these seasonal factors and trends is highly desirable. It will be presented in a forthcoming letter and our monthly REVIEW. At that time more complete details also will be given regarding the materials and methods utilized in constructing the Index of the Volume of Manufacture presented in this letter.



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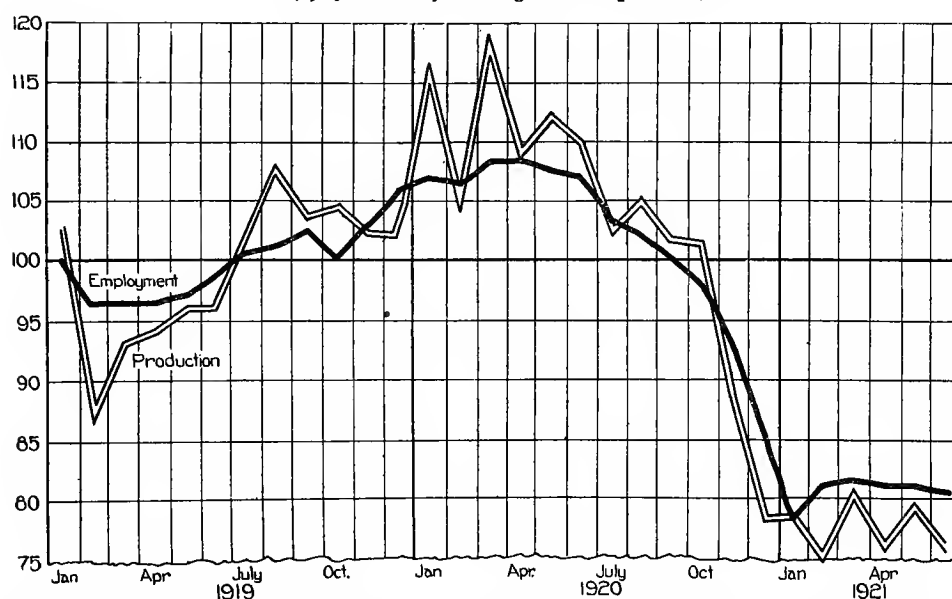
# INDUSTRIAL EMPLOYMENT

*Special Letter — October 8, 1921*

EMPLOYMENT conditions are one of the fundamental elements of the business cycle. Measurement of fluctuation in employment throws useful light on the course of the labor market; it also aids the understanding of industrial conditions. An index of employment is presented below, together with the index of the physical volume of manufacture which appeared in our *Special Letter* of September 20. According to these indices employment and production in manufacturing industries for July, the most recent month for which comparable figures are available (not shown on the chart), were 20 or 30 per cent below the average of 1919.

CHART I. — INDICES OF INDUSTRIAL EMPLOYMENT AND PRODUCTION

(1919 Monthly Average = 100 per cent)



The index of employment, in addition to showing changes in employment as such, serves two other purposes. First, it indicates approximately the buying power of the wage-earning population from current earnings. An increase or decrease in employment brings with it a corresponding increase or decrease in the aggregate earnings, even if wage rates remain the same. Moreover, the rate of wages itself responds to fluctuations in employment, since wage rates tend to be high when employment is active, and low when employment is dull. Thus full employment at high rates increases the purchasing power of labor; unemployment decreases that power. Second, the employment index gives us an indirect measure of production, as is shown by Chart I.<sup>1</sup> Throughout the thirty months covered, the curves representing employment and the volume of manufacture show change

<sup>1</sup> The coefficient of correlation is 96 per cent.

of direction at nearly the same time. Every critical movement is shown with almost equal clearness in both curves: the relapse after the armistice, the recovery in the second, third and fourth quarters of 1919, the culmination of the boom early in 1920, the ebb of prosperity, at first slow, then precipitate, until the early months of 1921, and the uncertain course during the past six or eight months.

Two significant differences between the curves appear: (1) The employment curve was much less disturbed than the production curve by the steel and coal strikes of September to December 1919, and the railroad congestion in February 1920. Partial explanation for this may be found in the fact that the supply of basic materials, which are the chief constituent of the production index, was perhaps affected much more by these disturbances than was the manufacture of semifinished and finished goods, which maintained itself during the interval, presumably on a carryover of raw materials. Again, employers doubtless tend to hold their labor force over a temporary shortage of raw materials incident to labor disputes in key industries; this is of course particularly likely at a time of prosperity. (2) It is clear that the production curves, if the temporary effect of these labor disputes is smoothed out, rose to a greater height in the boom of 1919-20, and recently fell to a greater depth, than did the employment curve. Employment rose only about 8 per cent above its 1919 average, production increased twice as much; in the present depression, employment has fallen only about 20 per cent, while production has decreased 25 per cent, below the average for 1919.

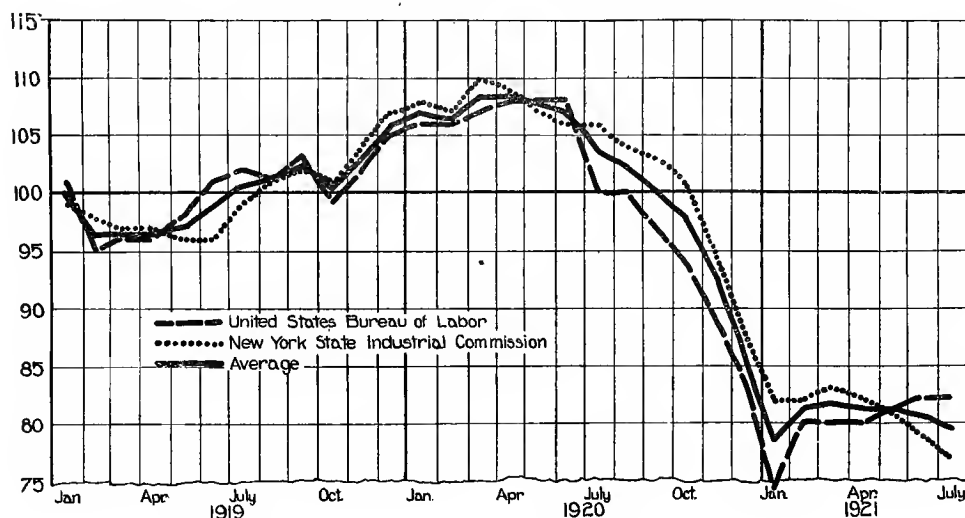
To what is the difference in the amplitude of the two indices due? It is impossible to get conclusive evidence on this point, but three considerations bear upon it. First of all, employment data are based on the number of employees on payrolls, and therefore tend to understate the real extent of labor activity in prosperity, since overtime work does not increase the number reported, and to overstate the extent of activity in depression, since part-time work does not decrease the number. In other words, no distinction is made, in the employment figures, between workers who are engaged part time, full time and more than full time. To a certain extent this source of inaccuracy is counterbalanced by a second consideration — fluctuations in the efficiency of labor. During prosperity labor efficiency is likely to diminish, partly because of industrial fatigue due to speeding and working overtime, partly because of indifference to duty in the face of plentiful opportunities for work in other establishments, and partly because of the hiring of untrained or inferior workers; in a depression the reverse is the case. A third consideration is the fact that the production index is necessarily derived, in large measure, from data on the production of basic materials, such as sole leather and steel ingots, rather than finished goods, such as shoes and machinery. The reason is that, in more advanced stages of manufacture, units of output are so varied and complex that few reliable data on production at these stages can be obtained. The employment data, on the other hand, relate to industrial groups at all stages of fabrication. If the production of basic materials responds more decisively to the course of the business cycle than do finished goods, the production curve would naturally swing through a greater range of variation than the employment curve.

Changes in labor efficiency would thus lead to greater fluctuations in the employment curve than in the production curve; while the existence of overtime or part-time work and the alleged sensitiveness of the production of basic materials would lead to narrower fluctuations in the employment curve, such as Chart 1 actually shows.

## THE DATA UTILIZED

In Chart 2 are shown the two basic indices upon which the employment index of Chart 1 is based. One set of data is collected by the United States Bureau of Labor Statistics from establishments employing 600,000 to 800,000 men, well distributed among the leading industrial states, about three-fourths of the total being in Pennsylvania, Massachusetts, Michigan, New York, Ohio, and Illinois. The other series, collected by the New York

CHART 2. — COMPARISON OF LEADING EMPLOYMENT INDICES  
(1919 Monthly Average = 100 per cent)



State Industrial Commission, relates solely to establishments in that state, and covers 400,000 to 600,000 workers. Neither bureau purports to cover the entire field of industry, but each secures reports from about a dozen large and fairly representative industrial groups. According to an investigation recently completed for the Committee on Economic Research, employment conditions in New York reflect with great accuracy those in the entire industrial section of the United States. From the New York unemployment data collected prior to 1916 an index has been constructed which is found to serve, not only as an employment index, but also as an index of the volume of business from 1903 to 1916. Throughout that period the employment figures registered general business conditions as well as did pig-iron production, outside clearings, and other statistical series commonly used.<sup>1</sup> In view of these findings, which will be presented in a forthcoming issue of the REVIEW, there seems to be ground for giving as much weight to the New York series as to that of the Bureau of Labor Statistics; accordingly the two were averaged, forming the middle curve on Chart 2. The seasonal element was found not important in either series.

The New York figures are based upon establishments nearly but not wholly different from those covered by the United States Bureau of Labor Statistics. Eighty-eight per cent of the wage earners embodied in the latter series are employed in other states than New York, and possibly some of the reporting 12 per cent employed within the state are not employed in establishments reporting to the New York Commission. Though practi-

<sup>1</sup> Moreover, the old unemployment series supports the newer employment series, showing nearly the same course of employment conditions in the years 1914-16, when both were reported.

cally independent as to source, the two indices follow nearly the same course during most of the period under review.<sup>1</sup> There are certain important discrepancies; for example, they disagree as to the precise month in which turning points occurred, upward in early 1919 and downward in early 1920. Equally striking is the fact that during 1921 the New York curve has, in general, continued downward, while the Bureau of Labor curve has moved fairly steadily upward. The contradiction is more apparent than real; comparing the two sets of figures we find that it is due in part to the heavier weight (about 35 per cent) given in the New York figures to metals and metal products, an industry which slumped very late and has shown little tendency to recover, and in part to the lighter weight (about 12 per cent) given in those figures to the textile industry in which some important branches have recovered very rapidly since the early part of the year.

## INDUSTRIAL GROUPS

In Chart 3 are shown employment indices for certain industrial groups, selected partly from the New York Industrial Commission, and partly from the United States Bureau of Labor Statistics. Examination of Chart 3 will disclose certain striking general facts, such as the depressed condition of late 1920 in the wool industry and that of early 1921 in the automobile industry, the recent tendency to recovery in many lines and the persistent failure of iron and steel, machinery and car-building to show any marked sign of improvement up to July. Chart 3 also enables us to determine (1) the order in which the depression overtook the various industries, (2) the relative severity with which it appears to have affected them, and (3) the order in which recovery appeared in each important industry. A similar review, based on the production data, has appeared in the *Special Letter* of September 20. Judgments based on the employment figures, where both employment and production data for the same industries are available, are nearly identical with those based on production figures.

Apparently the first to feel the depression of 1920 were the food and leather industries, in which decline began in the months from December 1919 to February 1920. Then followed automobiles (April), boots and shoes (April), clothing, etc. (April), woolens (June). After a considerable lapse came cotton manufactures (August), machinery, including electrical machinery (August), wood manufactures (October), iron and steel (November), paper (November), printing and book-making (December), and chemicals (December). From the employment data, the depression appears to have been most severe in the automobile and woolen industries, considerably less so in car-building and iron and steel. Machinery and leather rank next, then come boots and shoes, paper, wood manufactures, clothing; and least affected of all were cotton manufactures, printing, and food, beverages and tobacco.

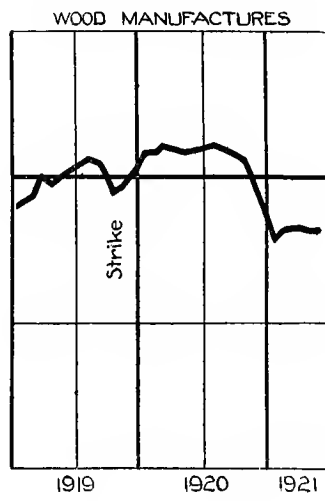
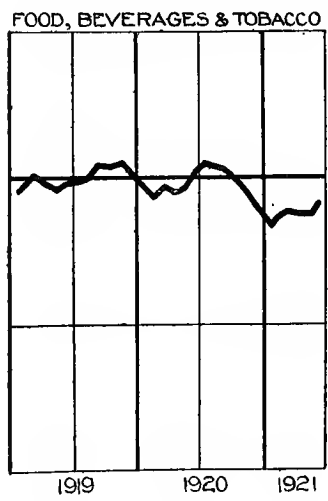
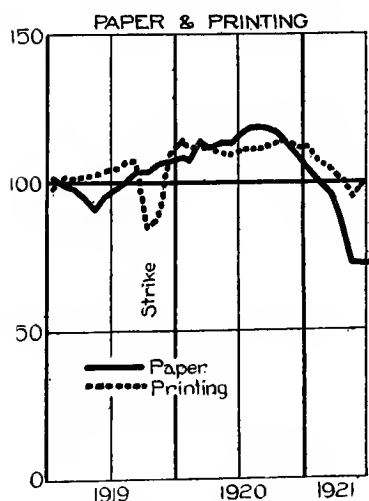
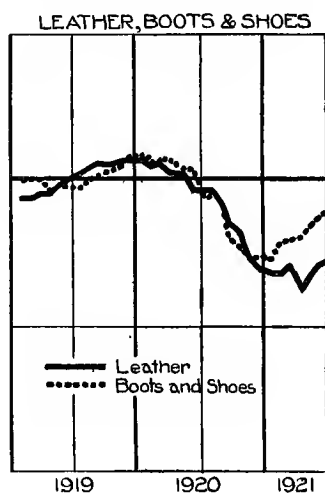
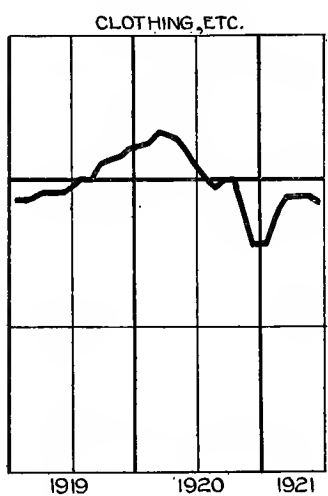
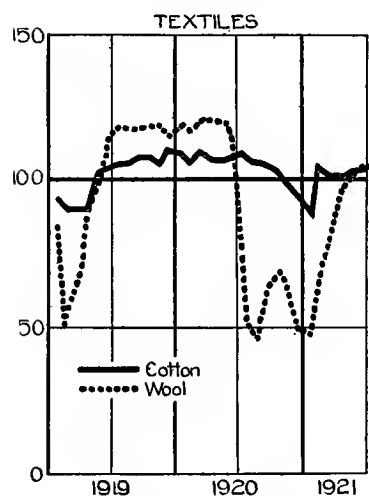
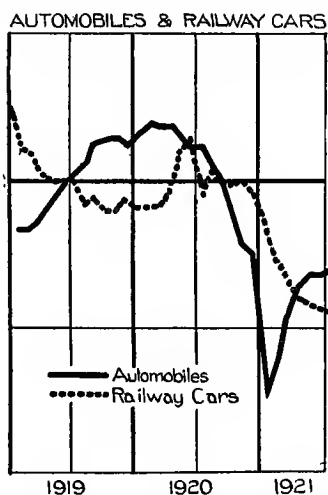
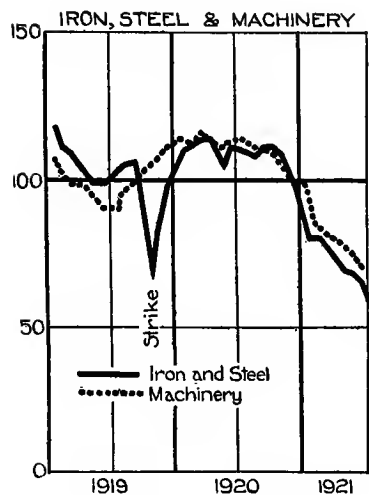
The recovery from depression seems first to have set in about February 1921, when it appeared in many lines — woolen, cotton, clothing, automobiles, wood, food, beverages and tobacco, leather, and boots and shoes. Paper and printing did not show recovery until June or later. For iron and steel the data for August show a turn for the better, as do also those for car-building. Most other industries continue to improve, and there seems ground to believe that better times are ahead for industry generally.

<sup>1</sup> The coefficient of correlation between the two employment indices is 95 per cent.



# CHART 3. — INDICES OF THE VOLUME OF EMPLOYMENT IN LEADING GROUPS OF MANUFACTURING INDUSTRIES

(1919 Monthly Average = 100 per cent)



The employment index seems clearly to act as a satisfactory register of the labor market and of production both for all industries and for each leading industry separately. The employment and production indices render nearly the same verdict as to the timing of the ebb and flow of the industrial cycle. The production of basic materials, embodied in the production index, we also conclude, reflects faithfully changes in production all along the line, for the production curve agrees with the employment curve, which covers industries at all stages. In amplitude, or sensitiveness of fluctuation, however, the two curves show noticeable but accountable differences. On the whole there seems good reason for making the indices of employment and production joint members of a composite index of industrial activity.

## PRESENT UNEMPLOYMENT

It is possible to obtain, as a by-product of the employment index, a rough test of the current estimates of unemployment. The estimate of 5,700,000 unemployed in manufacturing, mining, transportation, etc., recently announced by the Department of Labor, was based largely on the decrease in numbers employed between early 1920 and the present. Since this figure refers to the shrinkage in the number on the pay rolls, it does not yield an accurate estimate of the volume of unemployment in the sense of involuntary idleness, because in the boom of 1920 thousands were employed whose activities have since been absorbed by the farm, the home, and the school. Undoubtedly the past year and a half has witnessed an extraordinary shifting of industrial labor; nevertheless the number leaving positions in industry is not the number unemployed, but rather a maximum or upper limit of the true figure. The Department of Labor estimate, therefore, is to be regarded as a maximum; that is, the number unemployed is probably less than this figure.

The amount of "unemployment" or shifting of labor from manufacturing industries is considerably less, when measured by the employment indices here presented, than according to the data of the United States Employment Service, upon which the estimate of the Bureau of Labor Statistics was primarily based. According to the latter, the drop in employment from January 1920 to September 1921 was about 42 per cent. According to the New York state index it was 28 per cent, and according to the long-established employment series of the Bureau of Labor Statistics itself, the drop was only 23 per cent. The valuable trade-union data collected by the Massachusetts Department of Labor and Industries shows a decline of 26 per cent. In short, these three sets of figures agree with each other and all fail to confirm the figures for the decrease of employment given by the United States Employment Service. This estimate included 3,900,000 unemployed for manufacturing and mechanical industries alone. According to our estimate based on preliminary data of the Census Bureau, there were in January 1920 not more than 12,000,000 persons employed in this group. From the three sets of figures referred to above there would appear to be about 3,000,000 fewer persons employed in the manufacturing and mechanical industries at the present time than twenty months ago. On the basis of these industries, then, the estimate of 5,700,000 seems unnecessarily high even as an upper limit of the number of unemployed. Even without endeavoring to test or revise the figures for transportation, mining, and other industries, the published figure can probably be reduced with safety by at least a million and possibly to a figure as low as 4,000,000.

## SOURCES AND METHODS

*Payroll data of the United States Bureau of Labor Statistics.* The data of the Bureau of Labor Statistics have appeared monthly in the *Labor Review* since October 1915; those utilized consist of month-to-month link relatives, based on identical establishments in the comparison of any two months. These links were combined to get chain relatives with January 1916 as 100 per cent. The base was then shifted to the year 1919 as 100 per cent, and new relatives computed for each of the fourteen industries as follows: (1) iron and steel,<sup>1</sup> (2) car-building and repairing,<sup>1</sup> (3) automobiles,<sup>1</sup> (4) cotton manufactures,<sup>1</sup> (5) cotton finishing, (6) woolens,<sup>1</sup> (7) silk, (8) men's clothing, (9) hosiery, (10) leather,<sup>1</sup> (11) boots and shoes,<sup>1</sup> (12) paper,<sup>1</sup> (13) cigars, and (14) coal. The series used by the Bureau in representing the combination of these groups is constructed by combining the chain relatives in a weighted arithmetic mean, using as weights the total numbers employed in those industries at the 1914 Census of Manufactures.

In March 1920 the series covered over 800,000 employees, and in July 1921 nearly 600,000. The percentage distribution by states is as follows:

	March 1920	July 1921		March 1920	July 1921
Pennsylvania.....	19.7	16.4	Missouri.....	2.2	2.7
Massachusetts.....	12.8	14.9	Indiana.....	2.8	2.4
Michigan.....	13.0	13.3	Maine.....	1.7	2.1
New York.....	12.6	12.2	Rhode Island.....	1.5	1.8
Ohio.....	9.0	7.1	Alabama.....	1.7	1.8
Illinois.....	6.8	6.9	Connecticut.....	1.4	1.5
New Hampshire.....	2.5	3.8	Colorado.....	1.3	1.1
New Jersey.....	2.7	3.1	All others.....	8.3	8.9

*Payroll data of New York Industrial Commission.* Since June 1914, the New York Industrial Commission has published several forms of employment indices. The index used here is the index of employment based on the figures for June 1914 as 100 per cent; for a given month, only those establishments are used which also reported in June 1914. Eleven major industrial groups are used, but indices for the component industries can be, and in certain cases were, segregated in this study. The groups are the following: (1) metals, machinery and conveyances, (2) textiles, (3) clothing, millinery and laundering,<sup>2</sup> (4) furs, leather and rubber goods, (5) food, beverages, and tobacco,<sup>2</sup> (6) printing and paper goods, (7) paper, (8) chemicals, oils, paints, etc.,<sup>2</sup> (9) wood manufactures,<sup>2</sup> (10) stone, clay and glass products, and (11) water, light and power.

The series covered over 600,000 employees in March 1920, and over 450,000 employees in June 1921, or about one-third of the factory workers in the entire state.

<sup>1</sup> These groups were selected for separate presentation in Chart 3.

<sup>2</sup> These groups were selected for separate presentation in Chart 3. In addition, machinery was taken from Group 1, printing and bookmaking from Group 6.

HARVARD UNIVERSITY COMMITTEE ON ECONOMIC RESEARCH  
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HARVARD UNIVERSITY  
COMMITTEE ON ECONOMIC RESEARCH

# THE VOLUME OF MANUFACTURE

INDEX FOR ALL GROUPS COMBINED  
ADJUSTED INDEX FOR THE TEXTILE GROUP

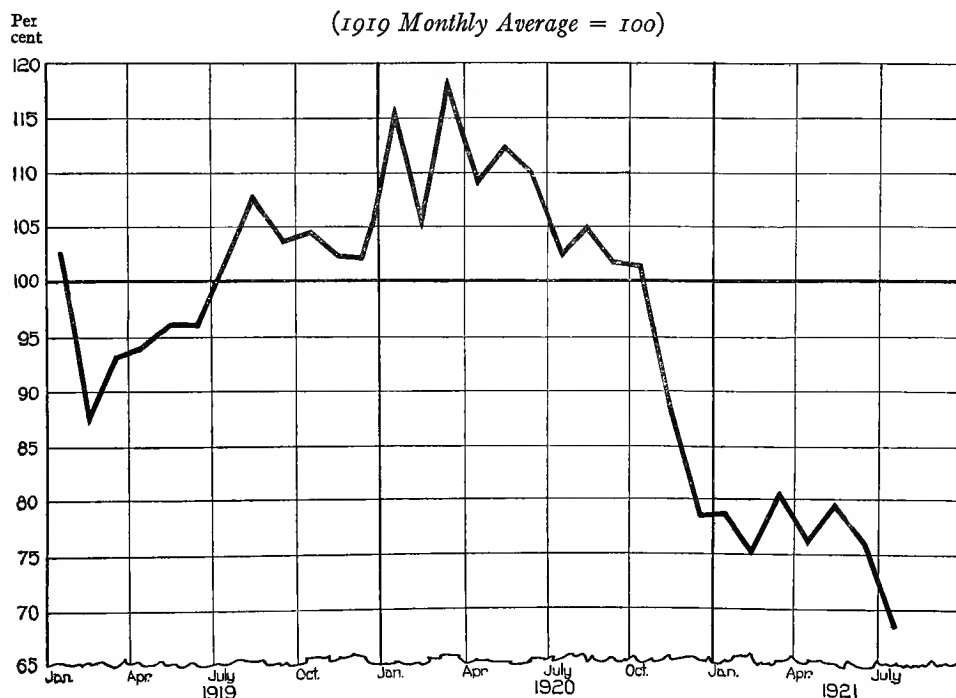
*Special Letter — October 22, 1921*

## ALL GROUPS

INDUSTRIAL output fell in July to the lowest level witnessed since the signing of the armistice. The Index of the Volume of Manufacture declined to 68.5, more than 6 points under the lowest previous figure. There is every indication that industrial output really touched bottom in July. While the data upon which the Index is based are not yet complete for August, the four group indices which are at hand — those for iron and steel, paper, textiles, and food — point to an index number for August of about 80.0. This

CHART I. — INDEX OF THE VOLUME OF MANUFACTURE

(1919 Monthly Average = 100)



represents a substantial improvement; and recent reports for September and October indicate that the improvement is not ephemeral. An upward movement of industrial output seems definitely under way.

The course of the several group indices during recent months is highly instructive. The most significant movement is that of iron and steel. In October 1920, the index for this industry stood at 126.7; in July 1921, at 34.0. In only one of the intervening months was

there the slightest pause in the precipitate decline. This rapid fall of output in the iron and steel trade has been the most striking feature of the industrial situation for nearly a year. It has completely offset the substantial gains made in many other lines. The fact that the movement seems finally to have run its course, suggests the probability of improved business conditions ahead.

The textile group in July showed a decline of about 11 points. Undoubtedly this was in part a seasonal movement. Even allowing for seasonal variation, however, a slight recession seems to have occurred. But in the textile group, as in iron and steel, August witnessed a recovery of lost ground. The index for the textile group for August is 100.7, equiv-

TABLE A. — MONTHLY INDICES OF THE VOLUME OF MANUFACTURE FOR EIGHT GROUPS OF MANUFACTURING INDUSTRIES AND FOR THE GROUPS COMBINED  
(1919 Monthly Average = 100)

Month	All groups	Iron and steel	Lumber	Paper	Petroleum	Textiles	Leather	Food	Tobacco
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<b>1919</b> January . . .	101.6	130.1	75.5	93.0	89.7	96.5	109.4	114.9	87.3
February ..	86.7	113.7	75.8	82.8	83.8	72.7	91.0	87.3	83.8
March . . . .	92.6	113.5	88.8	87.0	92.8	79.0	92.8	92.1	97.7
April . . . . .	93.7	94.6	97.8	88.4	92.4	92.9	108.7	92.8	82.0
May . . . . .	95.7	81.2	112.1	95.1	100.7	99.2	106.3	98.5	88.0
June . . . . .	95.9	90.9	103.5	98.3	96.1	100.2	108.6	83.8	92.9
July . . . . .	101.9	103.1	103.7	103.3	103.7	109.4	99.8	85.9	99.3
August . . . .	107.2	113.5	123.4	108.8	107.4	103.4	102.6	88.4	101.1
September .	103.8	97.6	113.8	106.2	108.3	105.3	102.0	97.7	108.6
October . . . .	104.4	73.2	123.4	116.4	112.0	119.3	101.4	111.2	125.4
November .	102.2	94.0	102.0	108.6	107.0	104.9	87.4	109.0	117.0
December . .	102.1	103.4	80.1	109.8	107.6	110.1	89.9	108.6	113.0
<b>1920</b> January ...	115.9	124.2	101.1	120.9	102.3	126.6	90.8	112.2	115.7
February ..	104.6	120.5	101.3	105.8	97.0	110.5	81.6	85.3	98.9
March . . . .	118.0	138.3	117.4	119.5	111.6	121.0	94.0	90.8	123.1
April . . . . .	108.8	111.0	122.3	121.7	109.3	119.3	84.7	75.9	108.0
May . . . . .	111.8	121.2	127.3	119.2	115.0	110.5	90.9	85.1	111.1
June . . . . .	109.6	124.9	115.4	122.5	115.9	104.1	95.2	80.8	114.4
July . . . . .	102.3	118.0	103.1	123.0	122.9	92.8	80.7	80.8	98.1
August . . . .	104.9	125.3	117.8	122.5	132.2	88.2	70.5	83.3	104.8
September .	101.4	125.0	108.7	119.3	134.6	83.4	73.3	78.0	104.9
October . . . .	101.2	126.7	108.1	119.7	135.2	78.7	77.8	81.1	106.3
November .	88.9	111.3	86.2	108.0	131.2	62.1	70.1	91.0	93.1
December . .	77.9	99.5	62.8	94.6	134.6	54.5	72.1	88.4	73.5
<b>1921</b> January ...	78.3	92.7	59.5	84.3	131.6	68.1	63.5	84.1	88.7
February ..	75.0	73.7	65.3	78.5	115.0	76.3	62.8	74.4	95.0
March . . . .	80.6	65.2	78.2	83.2	117.9	89.3	72.0	85.6	106.6
April . . . . .	75.8	50.5	84.6	79.3	124.9	89.3	75.8	82.4	96.6
May . . . . .	79.3	52.4	100.7	73.6	122.8	96.2	83.2	79.9	100.6
June . . . . .	75.9	42.3	93.3	75.6	122.7	100.8	81.1	82.7	108.0
July . . . . .	68.5	34.0	86.8	71.0	119.5	89.5	76.3	84.5	101.8
August . . . .	....	46.0	....	84.4	....	100.7	....	96.3	....

alent to the index for June and substantially above the index for any other month since June 1920. As a whole the textile group is now operating on the average level of 1919.

Three of the other group indices — those for lumber, petroleum, leather — show slight declines from May to July. The movement is not serious in any case, possibly excepting lumber, and presumably is due largely to seasonal influence. An increase of output in these lines seems reasonably assured during the more active months of the fall.

The paper industry has behaved throughout the cycle much like the iron and steel trade. It was late in experiencing the shock of business reaction in 1920, showing no marked decline until November. While the subsequent slump was not as severe as in the iron and steel industry, the paper trade registered the same sudden decline from late 1920 until July of this year. Like iron and steel, it showed a marked improvement of output in August and seems now to have turned the corner toward better conditions.

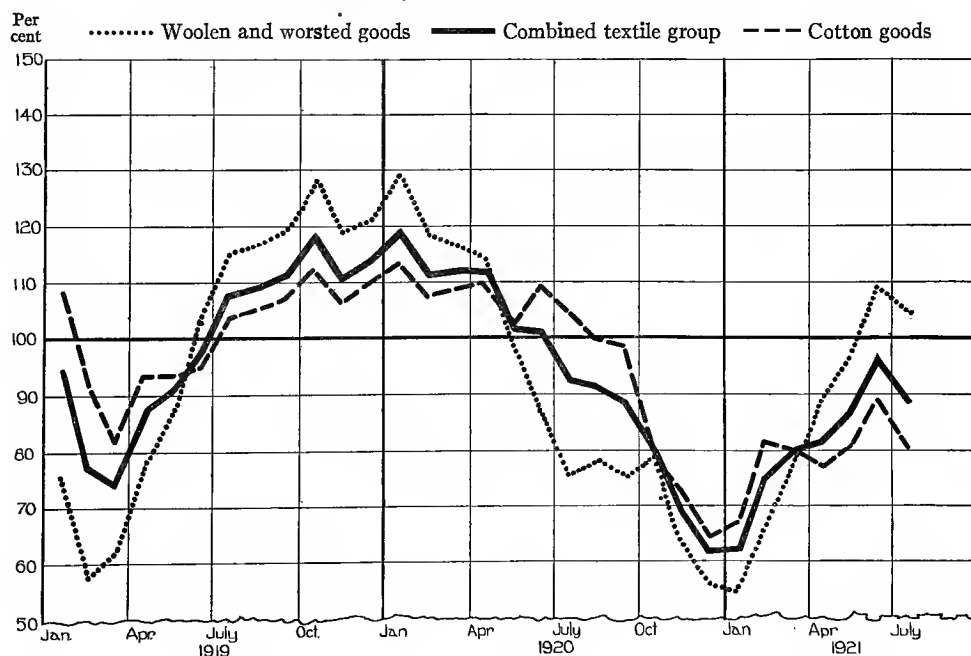
The group which has shown the most consistent gain during recent months is that producing foodstuffs. The index for this group has risen steadily since May and showed in August the highest figure since January 1920. Undoubtedly some of this movement is due to seasonal influences, but an increase of output is clearly taking place in this fundamental line of production. In this the group is but showing a tendency now typical of manufacture in the United States.

## ADJUSTED INDEX FOR THE TEXTILE GROUP

The group index of the volume of manufacture in the textile trades, given by months from January 1919 to August 1921 in Table A, rests upon series of relatives wholly uncor-

CHART 2. — ADJUSTED INDICES OF THE VOLUME OF MANUFACTURE

(Ordinates of Trend = "Normal" = 100)



rected for long-time trends and seasonal variations. In brief the relatives are simple percentages of 1919 monthly averages. Within certain limits the index in this form is entirely

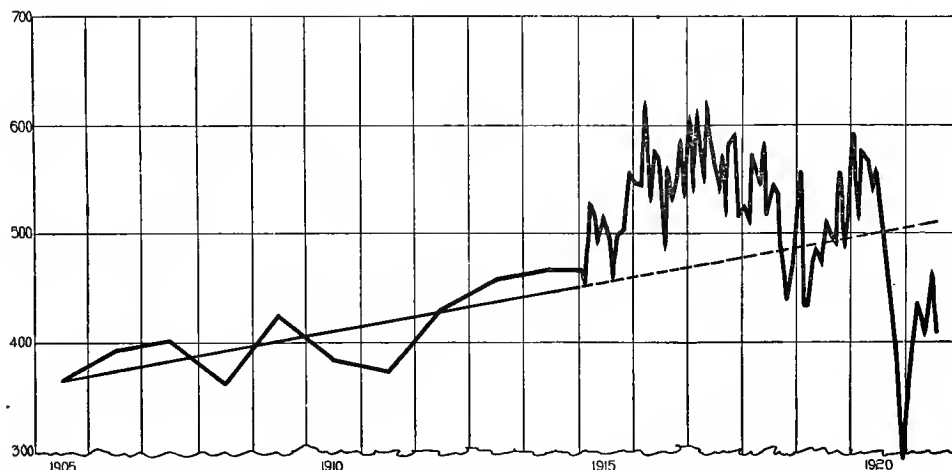
satisfactory. For some purposes, however, it is desirable that the index should show the cyclical changes of industrial output undisturbed by other movements. Such an index of the volume of manufacture for the textile group, adjusted for elements of growth and seasonal variation, appears above.

The general course of the adjusted index is not unlike that of the unadjusted index charted in the diagram on page 5 of the *Special Letter* of September 20. Upon the whole, as might be expected, the adjusted index shows a steadier movement. Its rise from the post-armistice slump is not as rapid as is that of the unadjusted index, and its decline after the peak of early 1920 is not so abrupt. Finally, it registers a somewhat more moderate recovery since the extreme of depression. Combining, as it does, the corrected figures for the two principal textile industries, cotton manufacture upon the one hand, and woolen and worsted manufacture upon the other, the adjusted index is a highly significant barometer of textile production since January 1919.

### COTTON GOODS

The series underlying the index of cotton manufacture is the monthly consumption of raw cotton exclusive of linters. The data are presented graphically in Chart 3. The monthly items of this series are available from September 1912 to date. Monthly average figures run back to the crop year ending August 31, 1909. By estimate from the series giving cotton consumption *inclusive* of linters, the average monthly consumption of raw cotton exclusive of linters may be carried a number of years further back. There is thus every opportunity to obtain reliable measurements of the long-time tendencies and seasonal

CHART 3. — MONTHLY CONSUMPTION OF RAW COTTON  
(in thousands of bales; exclusive of linters)



factors of cotton manufacture as represented in the consumption of the basic raw material. The long-time trend of the series has been determined by fitting a straight line to the monthly averages of the crop years 1905-14.<sup>1</sup> Seasonal factors have been obtained from the monthly link relatives September 1912 to date.<sup>2</sup> Finally each item of the monthly

<sup>1</sup> The equation is  $y = 8.816x + 405.9$ , the unit of consumption being 1,000 bales, the unit of time 12 months, and the origin September 1, 1910.

<sup>2</sup> Full details will be given in a later issue of the REVIEW OF ECONOMIC STATISTICS.



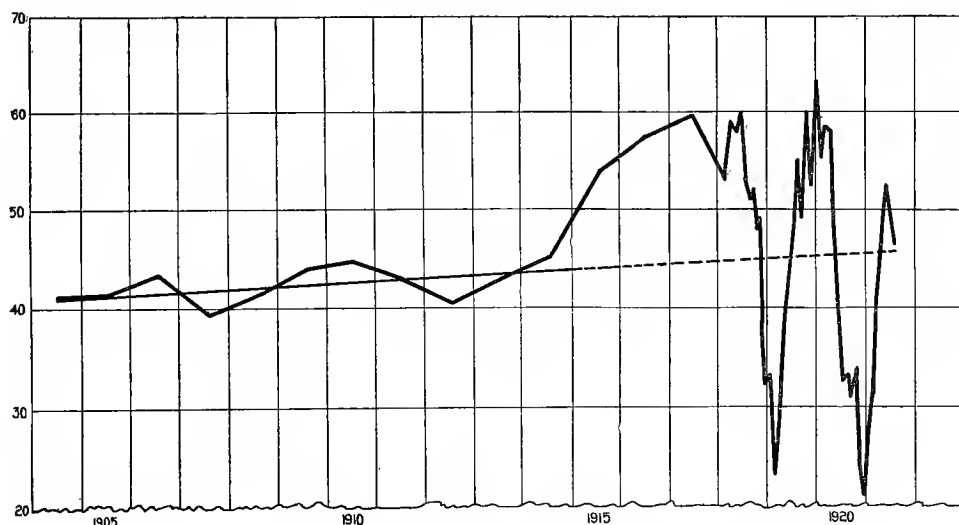
series of raw cotton consumption has been reduced to the form of a percentage of normal consumption, normal being taken as the trend corrected for seasonal influences. The resultant percentage relatives register the cyclical fluctuations of cotton manufacture, undisturbed by the influence of normal growth or seasonal variation. They appear for the months January 1919 to August 1921 in column (b) of Table B and in Charts 2 and 5.

### WOOLEN AND WORSTED GOODS

The adjusted index for woolen and worsted goods rests upon two varieties of data, one consisting of the single series *wool consumption*, the other of three series reporting the percentage of *active wool machinery*. The three machinery series employed are those showing the percentage active of (1) woolen spindles, (2) worsted spindles, and (3) wide looms. These three series have been combined into a single machinery index which in turn has been averaged with the series of wool consumption.

The analysis of the wool consumption series follows the standard method adopted in handling the records of raw cotton consumption. The data appear in Chart 4. The trend of wool consumption has been ascertained by taking a centered three-year moving average of wool *available for consumption* for the fiscal years from 1904 to 1914.<sup>1</sup> Seasonal factors have been approximated, partly on the basis of the monthly items which are available from January 1918 to date, partly through consultation with experts in the industry.<sup>2</sup>

CHART 4. — MONTHLY CONSUMPTION OF WOOL  
(in millions of pounds)



This measurement of trend and seasonal factors permits of a reduction of the monthly figures of wool consumption to percentages of normal consumption. These cyclical items for the period January 1919 to August 1921 are given in full in column (d) of Table B and are shown graphically in Chart 2.

<sup>1</sup> The equation is  $y = .262x + 42.43$ , the unit of consumption being one million pounds, the unit of time 12 months, and the origin January 1, 1909.

<sup>2</sup> The details of method here and elsewhere in this study will be set forth in subsequent issues of the REVIEW.

The utilization of the data on active wool machinery follows a somewhat different course.<sup>1</sup> For these series, data are available in quarterly form as far back as 1913. No trend is discernible, nor is any to be expected. The percentage of idle, or of active machinery in any industry will seldom show any tendency toward marked increase or decrease. The problem is to determine the normal percentage of inactivity. The earlier study of the volume of manufacture, based upon annual data, showed that production in the woollen and worsted industry was normal during 1914. The percentage of machinery active during 1914 has consequently been taken as a base from which to measure the deviations of the current monthly data on wool machinery. Thus it has been assumed on the basis of the 1914 records that, in the reports of active machinery, 75 per cent active for wide looms is normal. Having reduced the original data by this method to percentages of normal, the relatives have been combined into a single machinery index, by first averaging the percentages for woollen and worsted spindles and then in turn averaging these results with the percentages for wide looms. The wool machinery index is given in the fourth column of Table V and in the upper right-hand diagram of Chart 5.

The adjusted index of the volume of woollen and worsted manufacture is finally obtained as an unweighted geometric mean of the two series, one based upon wool consumption, the other upon active woollen and worsted machinery. This index for the woollen and worsted trade, showing the cyclical movements of the industry properly corrected for trend and seasonal variation, appears in the index chart for the textile group and is given in full in column (c) of Table B.<sup>2</sup>

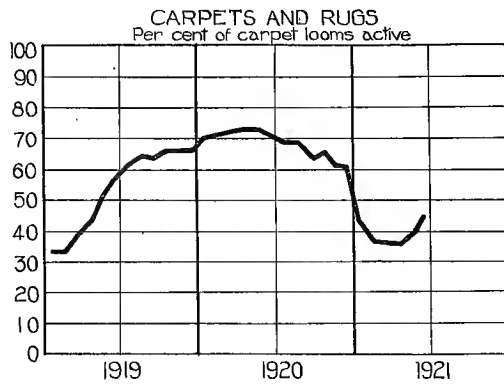
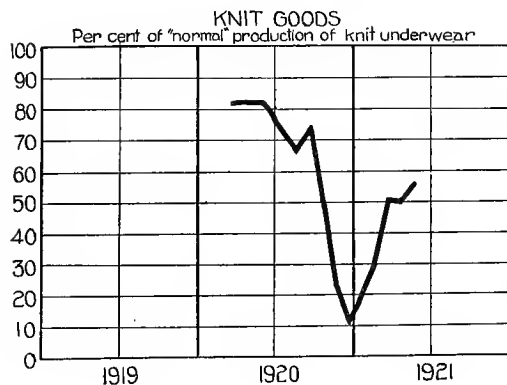
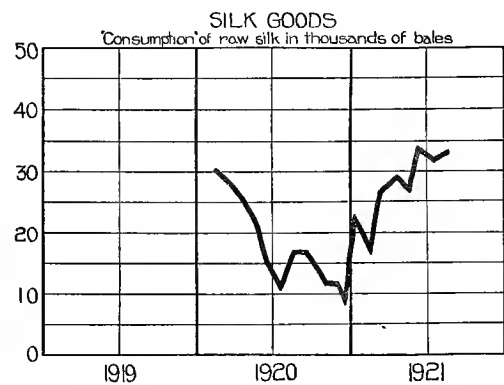
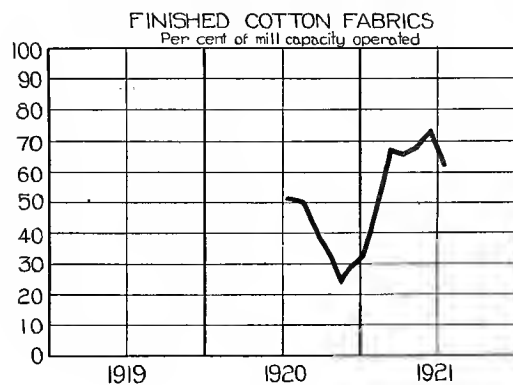
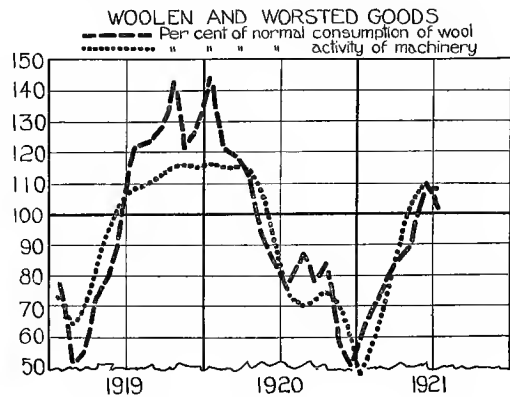
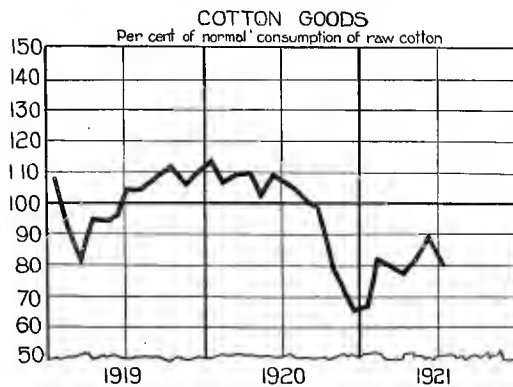
This examination of cyclical fluctuations in the textile group would not be complete without reference to several additional series which throw some light upon the subject, though they are not in shape for satisfactory incorporation in the index. The most significant of these series are (1) the percentage of capacity operated among mills turning out finished cotton fabrics, returned regularly to the Federal Reserve Board by the Association of Finishers of Cotton Fabrics; (2) the per cent of normal production of knit underwear, reported by members of the Knit Goods Manufacturers of America; (3) the consumption of raw silk, estimated by the Silk Association of America on the basis of imports and stocks in storage; and (4) the per cent of carpet looms active, in the wool machinery figures of the Bureau of the Census. These series are given in Table B and shown graphically in the diagrams of Chart 5. While the series cannot be reduced to a form directly comparable with the indices, the general character of the fluctuations disclosed is significant. The per cent of capacity operated in the production of finished cotton fabrics and the per cent of normal production of knit underwear follow the same general course as the adjusted index for cotton manufacture. The range of fluctuation is different but the timing of movements is almost identical. Raw silk consumption from April 1920 to date follows a course not unlike that shown by the index of woollen and worsted manufacture; a rapid decline features the first six months of 1920; the second six months show consumption upon a low level, and 1921 witnesses a conspicuous recovery. Only the series for carpets and rugs displays marked

<sup>1</sup> As a matter of fact the original items are reported as percentages of wool machinery *idle*. Conversion to percentages active is a matter of simple subtraction from 100.

<sup>2</sup> The final step in the construction of the adjusted index for the textile group is a simple matter of taking a weighted geometric mean of the adjusted indices of the two major textile industries. The weights employed in obtaining the mean are: cotton manufacture 5, woollen and worsted manufacture 3. The index has already been presented on pages 3 and 4. It is given numerically in the first column of Table B.

divergences. Apparently this industry kept upon a high level of output much longer than others of the textile group and has experienced, since the extremes of depression, distinctly less improvement.

CHART 5—SERIES INDICATIVE OF THE VOLUME OF TEXTILE MANUFACTURE



While these comments must be looked upon as provisional — for the series will not permit of the standard analysis upon which the adjusted indices are based — they suggest that the entire textile group has been subject to much the same experience since January 1919.

The character of that experience is registered with reasonable accuracy in the adjusted index of the volume of textile manufacture.

TABLE B.—SERIES INDICATIVE OF THE VOLUME OF MANUFACTURE \*

Month	ADJUSTED INDICES			WOOLEN AND WORSTED GOODS		FINISHED COTTON FABRICS	KNIT GOODS	CARPETS AND RUGS
	Textile group †	Cotton industry ‡	Woollen and worsted industry	Per cent of normal consumption of wool	Per cent of normal activity of spindles and looms	Per cent of mill capacity operated	Per cent of normal production of knit underwear	Per cent of carpet looms active
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
<b>1919</b>								
January ..	94.6	108.5	75.3	77.5	73.3	....	....	34.2
February .	77.2	92.1	57.5	51.5	64.2	....	....	34.4
March ...	73.8	82.1	61.8	55.1	69.4	....	....	38.6
April .....	87.5	93.7	78.1	71.9	84.8	....	....	42.9
May .....	91.3	93.7	87.4	80.0	95.5	....	....	51.1
June .....	98.0	94.9	103.4	103.4	103.6	....	....	55.5
July .....	107.9	103.7	115.1	121.9	108.7	....	....	61.4
August ...	109.0	104.9	116.4	123.5	109.6	....	....	64.5
September	111.6	107.1	119.7	127.4	112.4	....	....	62.8
October ..	118.1	112.6	128.2	143.0	115.2	....	....	65.9
November	110.4	105.9	118.4	121.1	116.0	....	....	65.5
December	113.9	109.8	121.4	127.9	115.2	....	....	66.5
<b>1920</b>								
January ..	119.1	113.5	129.3	144.5	115.6	....	81.7	69.8
February .	111.4	107.3	118.6	122.1	115.0	....	80.3	71.4
March ...	112.0	109.2	116.7	118.9	114.6	....	81.7	72.3
April .....	111.7	110.3	114.0	112.9	115.0	....	82.1	71.8
May .....	101.2	102.4	99.2	91.8	107.1	....	82.2	71.5
June .....	100.3	109.3	86.9	84.7	89.2	....	80.3	70.9
July .....	92.6	105.0	75.3	76.4	74.3	51	73.4	67.9
August ...	91.4	100.2	78.2	87.4	70.0	50	67.3	67.7
September	89.1	98.6	75.1	78.1	72.2	41	74.2	64.3
October ..	79.4	79.4	79.2	84.1	74.7	33	50.4	65.3
November	69.1	72.5	63.8	58.1	70.0	25	23.2	61.5
December	61.3	64.8	55.8	50.8	61.4	29	11.0	59.9
<b>1921</b>								
January ..	61.9	66.6	54.7	62.8	47.6	33	16.4	42.6
February .	75.2	81.7	65.5	69.1	61.9	51	28.0	36.5
March ...	79.7	80.0	79.2	79.7	78.6	67	50.1	36.1
April .....	81.6	77.1	89.7	86.5	93.1	66	49.6	35.7
May .....	86.3	80.7	96.7	90.0	104.0	68	55.4	38.0
June .....	96.2	89.1	109.4	109.9	108.9	74	65.5	44.1
July .....	88.8	80.5	104.7	101.6	107.8	62	51.2	....
August ...	106.3 §	95.4	....	127.1	....	....	71.1	....

\* For data on consumption of raw cotton, wool, and raw silk, see issues of *Current Statistics*, Section III, Table 1.

† Weighted geometric average of columns (b) and (c).

|| Geometric average of columns (d) and (e).

‡ Per cent of normal consumption of raw cotton.

§ Provisional.

HARVARD UNIVERSITY  
COMMITTEE ON ECONOMIC RESEARCH

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## THE COMMODITY PRICE SITUATION

*Special Letter — November 8, 1921*

THE present commodity price situation differs strikingly from that in 1913, the last year preceding the price upheaval accompanying the war. Individual prices now are in very different relationships to each other and to the general level. This dislocation seriously curtails the purchasing power of important groups of consumers. Unusual or abnormal as the present situation seems on the surface, similar situations have, nevertheless, been recurrent in the past. The price situation of the present period of business depression differs from that of similar periods of the past in degree rather than in kind, while the relatively low price at present of many raw materials and of other articles used in production is a favorable circumstance for manufacturing activity.

Two types of changes are always taking place in the price movement of individual commodities. The first is the long-time change, which means that a single commodity is becoming cheaper or dearer during a number of years. The long-time trends of the prices of different commodities differ greatly; some tend to rise rapidly, others slowly, some to decrease. The result of these differences, over a number of years, is to change radically price relationships; certain commodities, for instance, growing dearer, command in exchange larger and larger amounts of those growing cheaper.

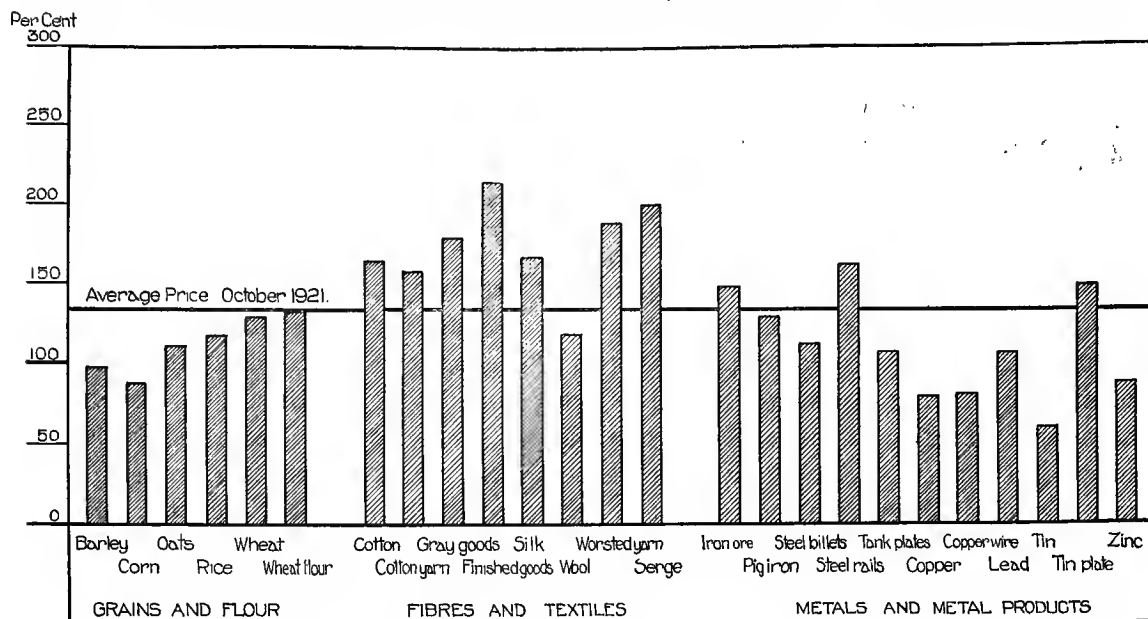
The second type of change is the fluctuation accompanying the business cycle, that is, low prices for most commodities in times of depression, and high prices in times of prosperity. This, likewise, affects commodities unequally; certain of them fluctuate violently, others only slightly, from times of prosperity to times of depression. Like depressions of the past, today's depression has created great disparities in commodity price relationships when compared with those of a period of business expansion. Thus, many raw materials are relatively cheap compared with finished products; whereas during the months of prosperity preceding the crisis of 1920 the reverse relationship generally obtained.

### COMPARISON OF PRICES AT PRESENT AND IN 1913

Chart I, on the following pages, compares graphically the present (October) prices of 49 commodities with their prices in 1913. The upright bars show the percentages which the present price of each commodity forms of the 1913 price. Such percentages will hereafter be referred to as "relative prices." The relative price of each commodity in 1913 is thus 100, as is also the average relative price of the 49, while the relative price for October is the percentage which the actual price forms of the actual 1913 price. The present average relative price of the 49 commodities considered is 133. Several of these commodities are selling far above the average level, while others are far below it.

The effect on purchasing power of such differences may be illustrated as follows: in 1913, a ton of bituminous coal sold for \$3.55 and a bushel of wheat for \$1.04. In October 1921, a ton of coal sold for \$6.75 and a bushel of wheat for \$1.34. Both have increased in price, but coal has increased more than wheat. To put the matter in another way:

CHART I. — RELATIVE WHOLESALE COMMODITY PRICES, OCTOBER 1921. (PRICE IN 1913 = 100)



3.4 bushels of wheat would buy a ton of soft coal in the year 1913, while in October 1921, five bushels would be required. Such differences involve hardships for the individual concerns and industries whose products are selling at a comparative disadvantage.

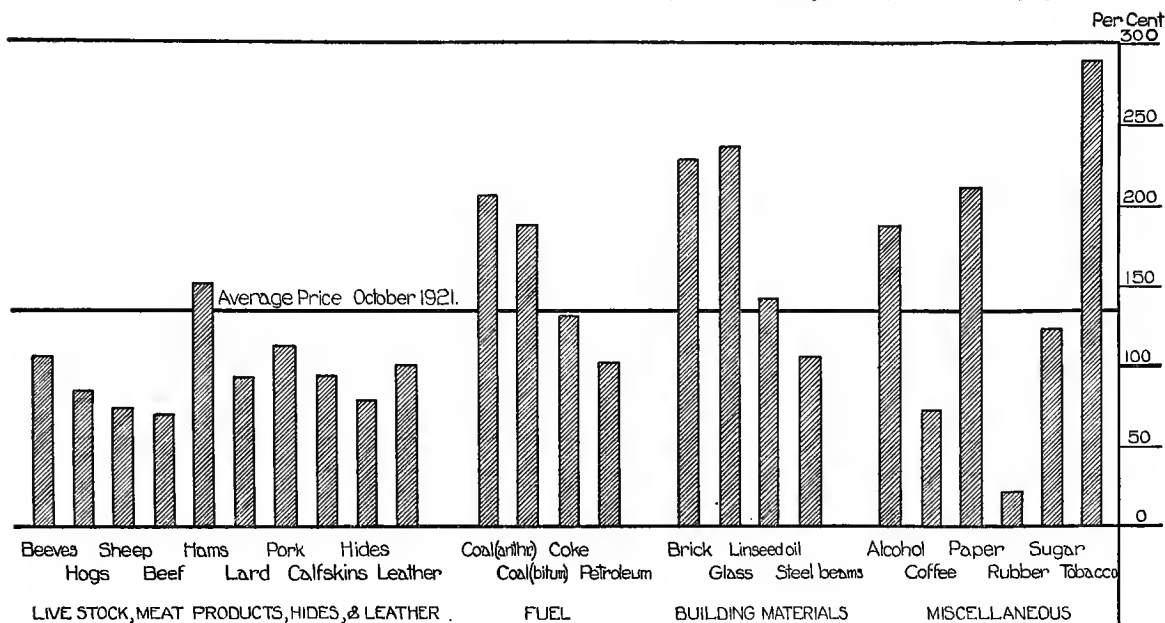
Anthracite coal, cotton finished goods, serge goods, brick, window glass, newspaper, and tobacco are all selling at prices twice as high, or more, than their respective 1913 figures. On the other hand, live sheep, beef, hides, copper, copper wire, tin, coffee, and rubber are selling well below their 1913 prices and very far below the October average price for the 49 commodities. These two groups show the extreme variation; between them lie other commodities, presenting similar, if less pronounced, differences. Bituminous coal, cotton gray goods, worsted yarn, and alcohol, although at relative prices somewhat below those of the first group of commodities enumerated, are nevertheless quite high. Corn, live hogs, lard, and zinc, although not as low comparatively as others, are much below the general level. Some commodities are selling close to the average level, but they are surprisingly few. Wheat, wheat flour, pig iron, and coke may be mentioned. The actual and relative prices for all commodities are given on page 8.

The differences between the changes which have taken place in the prices of individual

#### RELATIVE PRICES OF 49 COMMODITIES BY GROUPS

Relative price (1913 = 100)	Number of commodities	Relative price (1913 = 100)	Number of commodities	Relative price (1913 = 100)	Number of commodities
20- 29 .....	1	110-119 .....	5	200-209 .....	2
30- 39 .....	0	120-129 .....	3	210-219 .....	2
40- 49 .....	0	130-139 .....	2	220-229 .....	1
50- 59 .....	0	140-149 .....	3	230-239 .....	1
60- 69 .....	1	150-159 .....	2	240-249 .....	0
70- 79 .....	4	160-169 .....	3	250-259 .....	0
80- 89 .....	5	170-179 .....	1	260-269 .....	0
90- 99 .....	3	180-189 .....	2	270-279 .....	0
100-109 .....	6	190-199 .....	1	280-289 .....	1
				Total .....	49

CHART I.—RELATIVE WHOLESALE COMMODITY PRICES, OCTOBER 1921. (PRICE IN 1913 = 100)



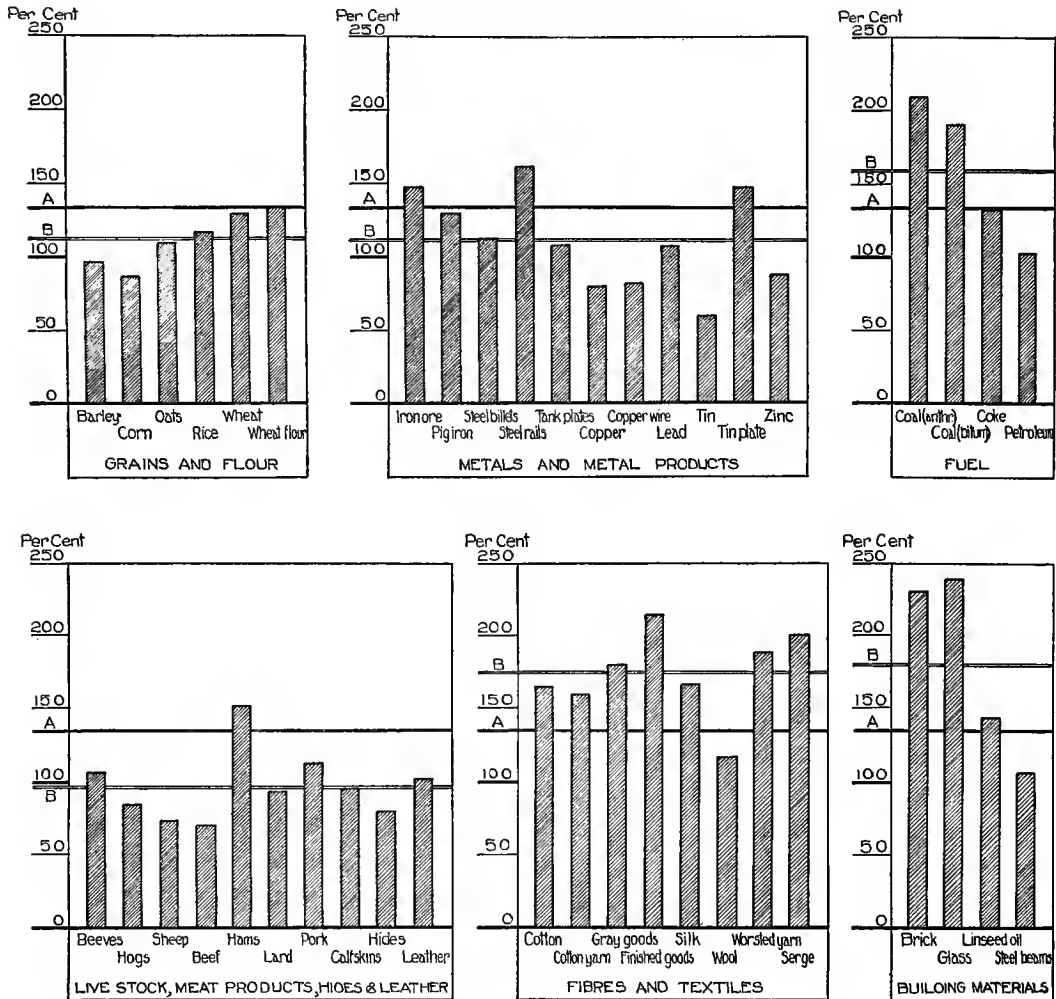
commodities is shown in another way in the frequency table on page 2. It gives the number of commodities whose relative price falls in each of 27 price groups. These groups extend, by ten units each, from the group 20-29 to the group 280-289. If all commodities had made about the same advance in price over 1913, the entire 49 would fall in the same group—presumably the group 130-139, since the average relative price, 133, is at present within that group. Instead of this, or some approximation of it, being the case, there is a decided scatter from 20 to 289.

Up to this point we have been comparing the commodities individually. The same sort of difference exists, however, between groups of commodities. For purposes of comparison the average relative price for each of seven groups has been computed. For each of four groups, namely, fibers and textiles, fuels, building materials, and miscellaneous, the average relative price is above the general average of 133; while in the case of the three other groups—grains and flour; live stock, meat products, hides and leather; and metal and metal products—the group average is below the general average. Two groups—fibers and textiles, and building materials—are very high, their average relative levels being 173 and 179, respectively. On the other hand, the group consisting of live stock, meat products, hides, and leather is 3 per cent below the 1913 level. Figures for all groups may be found in the table on page 8, and the data are presented graphically by the charts on page 4. In each one of these group charts the horizontal line designated “A” represents the average price level of all 49 commodities, i. e., 133 on the base of 100; and the line designated “B” represents the average price of the commodities within the particular group.

Certain contrasts may be pointed out between individual commodities within some of the separate groups. For example, in the group of grains and flour there is pronounced disparity between the current levels of corn and wheat. Corn is 13 per cent below its 1913 price; while wheat is 28 per cent above its 1913 price, being somewhat below the average level for the 49 commodities considered, although the group of grains and flour as a whole is far below the average relative price. In the groups of metals and metal products the non-ferrous metals bring down the group average to the point at which it stands; iron and steel

prices coincide almost exactly with the general average. The fibers and textiles group is at a price level much above the general average, and the individual commodities within this group are uniformly high, with the striking exception of wool, the current price of which is only 18 per cent above the 1913 figure. Among the fuels, petroleum is comparatively low,

CHART II. — RELATIVE WHOLESALE COMMODITY PRICES BY GROUPS, OCTOBER 1921  
(PRICE IN 1913 = 100)



102 per cent of its pre-war price; on the other hand, coal, both bituminous and anthracite, is at an extremely high level. A similar contrast exists between the low relative price of steel beams and the high prices of the other commodities in the building materials group.

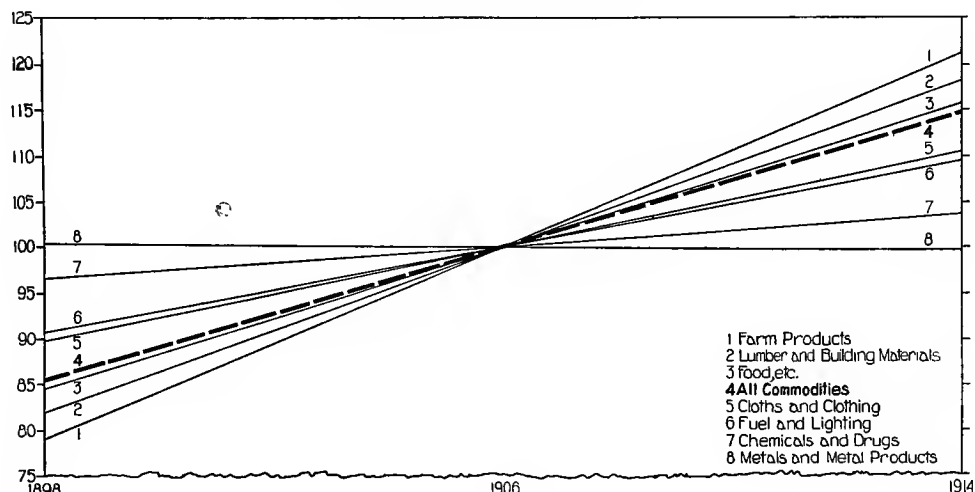
Our use of prices in the year 1913 as the base of comparison for present prices should not be taken to indicate that we consider that price relationships of commodities in that year are relationships to which we must return and, therefore, constitute a standard for future price revisions. Our object in making such comparison, in this *Special Letter* and that of August 12, is to set forth the disparities or maladjustments in purchasing power of different commodities resulting from the price upheaval since the war. In the following sections we have an additional object: that is, to show that there are influences normally at work to change the prices of individual commodities and also their adjustment to one another.



## THE PRE-WAR PRICE TREND OF VARIOUS COMMODITIES

The diverse trends of various commodities and groups of commodities during an extended period, say since 1898, show that previous to 1913 the relationships among commodities had been changing gradually, producing slowly the same sort of "maladjustment" as that existing today. The lines on Chart III show the direction of movement of the prices of seven groups of commodities for which indices are published by the United States Bureau

CHART III. — THE DIRECTION OF MOVEMENT OF THE PRICES OF VARIOUS GROUPS OF COMMODITIES, 1898-1914



of Labor Statistics. Each line passes through the arithmetic average price for the period. Each has a slope depending upon the actual price movement of the commodity group for which the line is determined. It will be seen from the chart that farm products, lumber and building materials, and food all increased more rapidly than "all commodities," while cloths and clothing, fuel and lighting, chemicals and drugs, and metals all increased less rapidly. In other words organic materials increased most rapidly, manufactured articles second, and mineral products least.

The course of prices of individual commodities supports the general conclusion stated in the preceding paragraph. For instance, the average annual price increase<sup>1</sup> of various important commodities is as follows: pork, 4.24; corn, 3.80; cotton, 3.47; oats, 3.14; beef, 3.12; hides, 3.05; wheat, 2.42; print cloths, 2.27; calf leather, 2.16; sheetings, 1.46; bituminous coal, 1.46; pig zinc, 1.43; lead, 0.15; pig iron, -0.01; copper, -0.20. It is evident that with the great variety of long-time movements in progress during the period 1898-1914 the intercommodity relationships were changing from year to year radically.

There is no reason for supposing that a diversity of long-time movements of commodity prices will not develop in the years to come as it has developed in the past. The comparison made in the first section brings out wide disparities between present price relationships and

<sup>1</sup> Expressed as percentages of the average price of the respective commodities for 1898-1914. Similar figures for all the groups of the Bureau of Labor Statistics are: farm products, 2.61; lumber and building materials, 2.27; house-furnishing goods, 2.05; food, etc., 1.93; all commodities, 1.83; miscellaneous, 1.40; cloths and clothing, 1.28; fuel and lighting, 1.18; chemicals and drugs, 0.45; metals and metal products, -0.02. Similar figures for 27 agricultural and mineral raw materials, 71 articles manufactured from them, and the 98 commodities combined, are, respectively, 2.62, 1.74, and 2.22

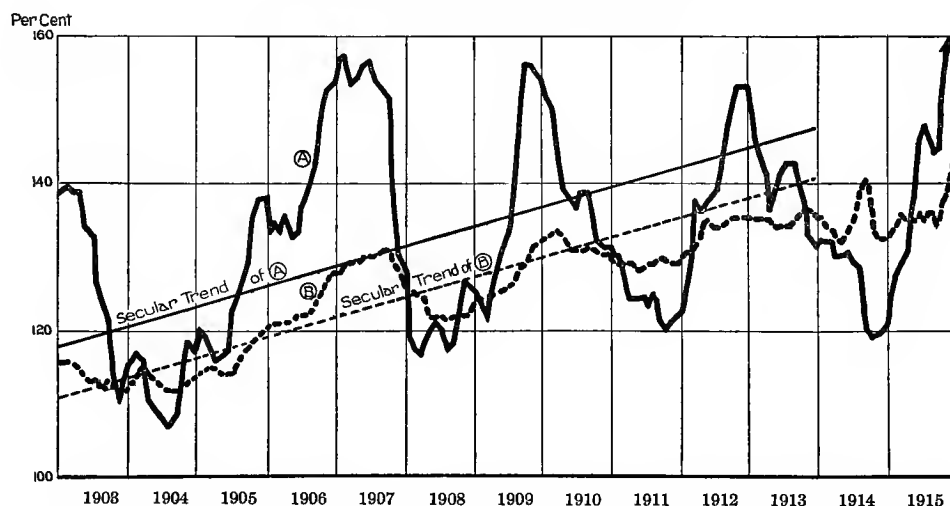
those of 1913. Doubtless these disparities are partly attributable to a fundamental divergence of the long-time movements of the prices of individual commodities.

### COMMODITY PRICE MOVEMENTS DURING BUSINESS CYCLES

We have seen that the prices for different commodities and for different groups of commodities move in different directions over a period of years, such as 1898-1914. Such long-time movements are not the only fluctuations which affect prices. The prices of commodities in general and of many different groups of commodities alternately rise and fall during periods of business prosperity and depression.

Although the prices of commodities in general and many groups of commodities rise and fall together during business cycles the extent of the rise or fall varies greatly for different commodities and groups of commodities. There are certain basic commodities, such as cottonseed oil, coke, pig zinc, pig iron, bar iron, mess pork, hides, print cloths, sheetings, and worsted yarns, which always have more violent price movements than do other commodities, such as steel rails, soda crackers, dress goods, wire, and shoes. In general, the prices of raw materials and of articles used in production respond in larger measure to changes in business conditions than do the prices of finished products. Chart IV shows the

CHART IV. — THE PRICE INDEX FOR TEN IMPORTANT COMMODITIES (A), COMPARED WITH THE PRICE INDEX OF THE BUREAU OF LABOR STATISTICS FOR ALL COMMODITIES (B), MONTHLY, 1903-15



price index of the ten basic commodities named above compared with the index of the *Bureau of Labor Statistics* based upon over 300 commodities. The amplitude of fluctuations of the ten-commodity index, (A), that is, the distance from peak to trough and trough to peak for the period 1903-14, ranged from 33 to 51 points and averaged 38 points, compared with a range of 4 to 19 points and an average of 9 points for the index of the Bureau, (B). In other words, during the pre-war period the prices of certain commodities and groups of commodities regularly increased in larger measure during business prosperity and declined in larger measure during depression than did other commodities. It appears, therefore, that a "normal" relationship between the prices of various commodities for one phase of the business cycle is not "normal" for another phase. In periods of depression, like the present,

it is usual for materials used in production to show much more drastic price recessions than do finished goods and goods ready for consumption.

The relationship which we have found for the pre-war period holds for the post-war period. Our ten-commodity index and the Bureau's index both reached the highest point in May 1920, and both reached bottom in July 1921. Our index declined 61 per cent, however, compared with 46 per cent for the Bureau's; in September the former index was 115 of the average for 1913, the latter, 152.

The extent of the price decline which occurred in 1920-21 was unparalleled; the irregularity of the decline, however, in which certain basic commodities reached very much lower points than did commodities in general, is "normal" for a period of business recession. Only the degree of the irregularity is unusual. The price situation in which we now find ourselves in 1921, therefore, is not unprecedented. Rather, it is a situation to be expected in the present phase of the business cycle. Price changes are in prospect, as they always are in prospect; it is probable that the prices of certain groups of commodities will advance very much more than will the prices of other groups, as always occurs when business is rising from the trough of depression. Our analysis leads us to the conclusion, consequently, that although many considerable price changes have occurred and others are in prospect, the present maladjustment of prices is merely the result of a somewhat greater disturbance than is usual in the present phase of the business cycle.

The great decline in the prices of certain commodities, such as farm products, has diminished the producing power of a considerable portion of our population and has thus acted as a depressing influence upon industry. But there is another side to the story; although price disparities have a depressing influence on certain industries they ultimately have a stimulating effect on other industries. In fact, a situation in which many materials for manufacture are relatively cheap compared with finished goods — the reverse of that obtaining before the declines of 1920-21 — is one which should lead to industrial activity.

## SOURCES AND METHODS

*Current data.* Four of the commodities used in the comparison of present prices with those of 1913 are composites of two or more similar commodities, as follows — (1) cotton yarn: southern two-ply chain warps, 2/20's, and southern frame cones, 10's; (2) cotton gray goods: print clothes, 28-in., 64 × 64, gray goods 39-in., 68 × 72, and brown sheeting 3-yd; (3) cotton-finished goods: standard prints, and standard staple gingham; (4) wool: Ohio fine delaine, and Ohio quarter blood. The quotations utilized in this study are those prevailing on or near the first of the month designated. They have been taken from the following sources: the *American Wool and Cotton Reporter*, *Bradstreet's*, the *Commerce Monthly* published by the National Bank of Commerce in New York, the *Daily Metal Reporter*, *Dun's Review*, the *Iron Age*, and the *New York Journal of Commerce*.

*Annual data, 1898-1914.* Lines of secular trend were fitted by the method of least squares to the group indices and to the prices of leading individual commodities which are published in *Bulletin No. 269* of the United States Bureau of Labor Statistics. The slope of each line thus found was expressed as a percentage of the average price 1898-1914 of the group or commodity for which the line was determined.

*Monthly data, 1903-15.* The criteria for the selection of the commodities used in our ten-commodity index, sources, methods, and data for the period 1890-1921 will be published in *THE REVIEW OF ECONOMIC STATISTICS* for November, 1921.

COMPARISON OF WHOLESALE PRICES OF 49 COMMODITIES IN OCTOBER 1921 WITH PRICES  
FOR THE YEAR 1913

Commodity	Unit	Price for the year 1913	Price in October 1921	Index No. for October 1921 (Price in 1913 = 100)
<b>GRAINS AND FLOUR</b>				<b>112</b>
Barley, No. 2, Milwaukee	bu.	.71	.69	97
Corn, No. 2, mixed, elevator	bu.	.698	.61	87
Oats, No. 3, white, elevator	bu.	.429	.47	110
Rice, domestic, good	lb.	.0579	.0675	116
Wheat, No. 2, red winter, elevator	bu.	1.0446	1.335	128
Wheat flour, straight winter	bbl.	4.52	6.00	133
<b>LIVE STOCK, MEAT PRODUCTS, HIDES AND LEATHER</b>				<b>97</b>
Beeves, best native steers, Chicago	100 lbs.	9.23	9.75	106
Hogs prime, Chicago	100 lbs.	8.48	7.20	85
Sheep, prime, Chicago	100 lbs.	5.76	4.25	74
Beef, family	bbl.	21.58	15.00	70
Hams, smoked	lb.	.164	.25	152
Lard, western steam	lb.	.1096	.1025	94
Pork, new mess	bbl.	22.06	25.00	113
Calfskins	lb.	.20	.19	95
Hides, native steers, No. 1	lb.	.1815	.145	80
Leather, oak, scoured backs, No. 1	lb.	.44	.45	102
<b>METALS AND METAL PRODUCTS</b>				<b>111</b>
Iron ore, old range, Bessemer, hematite	ton	4.35	6.45	148
Pig iron, Bessemer, Pittsburgh	ton	17.12	21.96	128
Steel billets, Bessemer, Pittsburgh	ton	25.79	29.00	112
Steel rails, standard Bessemer, Pittsburgh	ton	28.00	45.00	161
Tank plates, Pittsburgh	lb.	.015	.016	107
Copper, electrolytic, New York	lb.	.1569	.1238	79
Copper wire, net, base price, f. o. b. mill	lb.	.1681	.1363	81
Lead, New York	lb.	.044	.047	107
Tin, New York	lb.	.4433	.2675	60
Tin plate, Pittsburgh	box	3.55	5.25	148
Zinc, New York	lb.	.0576	.0505	88
<b>FIBERS AND TEXTILES</b>				<b>173</b>
Cotton, middling upland, spot, New York	lb.	.129	.211	164
Cotton yarn, New York *	lb.	.225	.355	158
Cotton gray goods, New York *	yd.	.0567	.1008	178
Cotton-finished goods, New York *	yd.	.0599	.128	214
Silk, shinshiu, No. 1, New York	lb.	3.65	6.05	166
Wool, clean basis, Boston *	lb.	.55	.65	118
Worsted yarn, 2-40's half blood, Bradford spun, Boston	lb.	.96	1.80	188
Serge, 11-oz., New York	yd.	1.21	2.425	200
<b>FUELS</b>				<b>158</b>
Coal, anthracite, stove sizes, New York	ton	5.10	10.56	207
Coal bituminous (Pitts.), f. o. b. Chicago	ton	3.55	6.75	190
Coke (Connellsville), furnace, f. o. b.	sh. ton	2.46	3.25	132
Petroleum, crude, New York	bbl.	2.45	2.50	102
<b>BUILDING MATERIALS</b>				<b>179</b>
Brick, Hudson river, hard, New York	1000	6.54	15.00	229
Glass, window, 10 x 15, New York	box	2.16	5.13	238
Linseed oil, New York	gal.	.49	.70	143
Steel beams, Pittsburgh	lb.	.105	.016	107
<b>MISCELLANEOUS</b>				<b>151</b>
Alcohol, 190 proof, U. S. P., New York	gal.	.251	4.70	187
Coffee, Rio No. 7, New York	lb.	.1124	.0825	73
Paper, news, roll, spot, New York	lb.	.0225	.0475	211
Rubber, plantation, first latex crepe, New York	lb.	.82	.1625	20
Sugar, standard granulated, New York	lb.	.0442	.055	124
Tobacco, medium leaf, Burley, Louisville	lb.	.0862	.25	289

\* Includes two or more commodities. See Sources and Methods, p. 7.

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# THE VOLUME OF MANUFACTURE

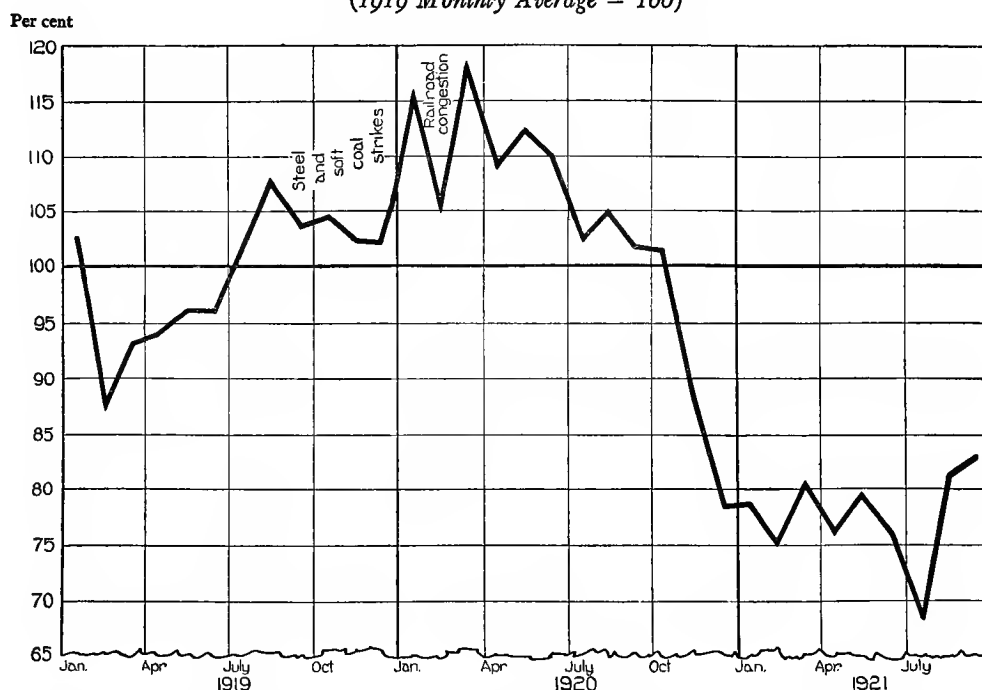
INDEX FOR ALL GROUPS COMBINED  
ADJUSTED INDICES FOR TEXTILES AND IRON AND STEEL

*Special Letter — November 29, 1921*

## ALL GROUPS COMBINED

IN our Special Letter of October 22, it was stated that “an upward movement of industrial output seems definitely under way.” More recent reports substantiate this view. This is true despite the somewhat disappointing record of September. Upon the whole, during September industry accomplished little more than a consolidation of the gains of August. Certainly no substantial new advance was registered. But the significant fact is that the

CHART 1. — INDEX OF THE VOLUME OF MANUFACTURE  
(1919 Monthly Average = 100)



progress made during late summer was firmly held. More recent weeks, from all accounts, have witnessed a real gain in output over the greater part of industry. The Index for October will probably show a marked rise, if for no other reason because of material improvement in the iron and steel trade. While the data for September and October are still incomplete, the Index for the former will probably be about 82, for the latter, considerably higher. Beyond question the underlying tendency at present is toward a larger volume of manufacture.

In part this situation is a natural consequence of seasonal influences. The fall months normally witness an increase of manufacturing activity in practically all lines. It will not be surprising if, for similar reasons, there is a moderate decline in output when winter sets in. Certainly an uninterrupted upward movement is not to be expected if the winter proves severe. But it is encouraging to find industrial output responding once more to seasonal factors and no longer completely under the influence of business depression. This fact promises well for the spring when the forces underlying industrial output should be unusually buoyant.

Turning to the indices for single industrial groups, the most significant movement is shown by the index for iron and steel. In July this index fell to the extraordinarily low figure of 34.0. In other words, the output of the iron and steel trade in July was only about one-third of the 1919 monthly average. In August the index rebounded to 46.0; in September it remained on approximately the same level; and in October it rose to 63.9. Of course, production is still very seriously below normal, but recent changes nevertheless represent real progress.<sup>1</sup>

Another line of manufacture which has recently made substantial headway is the paper trade. The index for this group stood at 71.0 in July; it has since risen to 88.2. Part of this change is typical of the trade at this season of the year; part of it is due to the breaking of the exceptional drought which visited the northeastern states during the summer and seriously interfered with the operation of paper mills depending upon water power. Whatever the causes of the advance, the improvement is unmistakable. "Many paper mills which were practically shut down during the summer are now running close to capacity." A further rise of the paper group index may reasonably be expected.

The food group is another which has recently shown somewhat greater output. Manufacture of foodstuffs — represented by flour, meat, and sugar — was, during September, as in August, fairly close to the 1919 average. Undoubtedly, this was due in part merely to the characteristic fall activity of these trades. Yet it is significant that the manufacture of food has been greater this fall than during the corresponding months of 1920. When it is remembered that 1919 was a year of record-breaking in several lines of food manufacture, the recent level of the food group index is gratifying.

The textile group has held firmly the ground gained during the first six or eight months of the year. The group index for September was 105.7, a figure not equaled since May 1920. Wool manufacture continues somewhat more active than cotton, but cotton has recently made consistent gains. As to output both industries appear now to have recovered largely from their collapse of 1920.<sup>2</sup>

The volume of manufacture in the remaining groups shows no change requiring detailed comment. In the production of lumber and leather no significant movement has occurred since May. In the output of petroleum products a slight downward tendency seems discernible but no radical change has been recorded since March. Tobacco manufacture rose in August to the highest level reported since early 1920, but output in this less important industry has at no time shown the sustained curtailment evident elsewhere. In general these groups have contributed little to the improvement of the past two or three months.

<sup>1</sup> A more detailed analysis of the situation in the iron and steel trade is to be found further on in this letter in the section dealing with an adjusted index for the iron and steel group.

<sup>2</sup> The course of cotton and wool manufacture is more satisfactorily examined in the following section devoted to the adjusted index for the textile group.

TABLE A. — MONTHLY INDICES OF THE VOLUME OF MANUFACTURE FOR EIGHT GROUPS OF MANUFACTURING INDUSTRIES AND FOR THE GROUPS COMBINED

(1919 Monthly Average = 100)

Month	All groups	Iron and steel	Lumber	Paper	Petroleum	Textiles	Leather	Food	Tobacco
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<b>1919</b> January . . .	101.6	130.1	75.5	93.0	89.7	96.5	109.4	114.9	87.3
February ..	86.7	113.7	75.8	82.8	83.8	72.7	91.0	87.3	83.8
March . . . .	92.6	113.5	88.8	87.0	92.8	79.0	92.8	92.1	97.7
April . . . . .	93.7	94.6	97.8	88.4	92.4	92.9	108.7	92.8	82.0
May . . . . .	95.7	81.2	112.1	95.1	100.7	99.2	106.3	98.5	88.0
June . . . . .	95.9	90.9	103.5	98.3	96.1	100.2	108.6	83.8	92.9
July . . . . .	101.9	103.1	103.7	103.3	103.7	109.4	99.8	85.9	99.3
August . . . .	107.2	113.5	123.4	108.8	107.4	103.4	102.6	88.4	101.1
September .	103.8	97.6	113.8	106.2	108.3	105.3	102.0	97.7	108.6
October . . . .	104.4	73.2	123.4	116.4	112.0	119.3	101.4	111.2	125.4
November .	102.2	94.0	102.0	108.6	107.0	104.9	87.4	109.0	117.0
December . .	102.1	103.4	80.1	109.8	107.6	110.1	89.9	108.6	113.0
<b>1920</b> January . .	115.9	124.2	101.1	120.9	102.3	126.6	90.8	112.2	115.7
February ..	104.6	120.5	101.3	105.8	97.0	110.5	81.6	85.3	98.9
March . . . .	118.0	138.3	117.4	119.5	111.6	121.0	94.0	90.8	123.1
April . . . . .	108.8	111.0	122.3	121.7	109.3	119.3	84.7	75.9	108.0
May . . . . .	111.8	121.2	127.3	119.2	115.0	110.5	90.9	85.1	111.1
June . . . . .	109.6	124.9	115.4	122.5	115.9	104.1	95.2	80.8	114.4
July . . . . .	102.3	118.0	103.1	123.0	122.9	92.8	80.7	80.8	98.1
August . . . .	104.9	125.3	117.8	122.5	132.2	88.2	70.5	83.3	104.8
September .	101.4	125.0	108.7	119.3	134.6	83.4	73.3	78.0	104.9
October . . . .	101.2	126.7	108.1	119.7	135.2	78.7	77.8	81.1	106.3
November .	88.9	111.3	86.2	108.0	131.2	62.1	70.1	91.0	93.1
December . .	77.9	99.5	62.8	94.6	134.6	54.5	72.1	88.4	73.5
<b>1921</b> January . .	78.3	92.7	59.5	84.3	131.6	68.1	63.5	84.1	88.7
February ..	75.0	73.7	65.3	78.5	115.0	76.3	62.8	74.4	95.0
March . . . .	80.6	65.2	78.2	83.2	117.9	89.3	72.0	85.6	106.6
April . . . . .	75.8	50.5	84.6	79.3	124.9	89.3	75.8	82.4	96.6
May . . . . .	79.3	52.4	100.7	73.6	122.8	96.2	83.2	79.9	100.6
June . . . . .	75.9	42.3	93.3	75.6	122.7	100.8	81.1	82.7	108.0
July . . . . .	68.5	34.0	86.8	71.0	119.7	89.5	76.3	84.5	101.8
August . . . .	81.2	46.0	99.6	84.4	119.7	100.7	85.7	96.3	118.3
September .	81.6 *	47.4	....	88.2	118.2	105.7	80.3	93.8	113.1
October . . . .	....	63.9	....	....	....	....	....	....	....

\* Subject to slight revision.

At the same time it should be noted that no one of the indices has recently registered a significant decline.

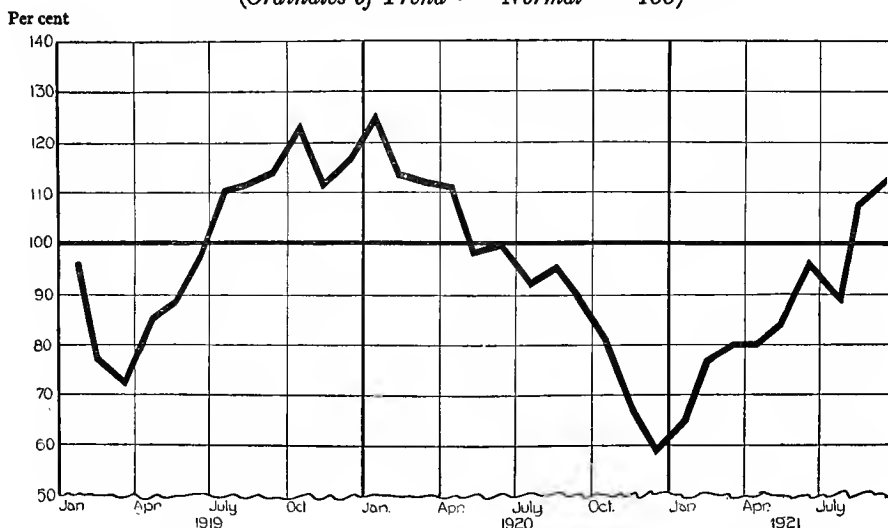
The period through which industry is now passing affords an excellent example of the need of an index properly adjusted for seasonal variations and long-time tendencies. We know that industrial output has recently increased, but we do not know how much of the increase is to be charged to customary fall activity. To put the question specifically — to what extent does the rise of the general index represent a net improvement in underlying

conditions — a real turn in the cycle? Only an adjusted index can provide the answer. Such an index for the textile group was presented in the Special Letter of October 22. This index is carried into October in the next section. In a final section of this letter a similar adjusted index is developed for the iron and steel trade.

## THE TEXTILE GROUP

The cycles of output since January 1919 in cotton and wool manufacture appears clearly in the index chart below. The numerical items of the index are given in full in Table B.<sup>1</sup> It will be recalled that in this adjusted index, allowances have been made for the normal growth of the industries and their characteristic seasonal movements. Fluctuations of the

CHART 2. — ADJUSTED INDEX FOR THE TEXTILE GROUP  
(Ordinates of Trend = "Normal" = 100)



index thus reflect the business cycle alone, disturbed, if at all, by fortuitous factors like strikes or extraordinary weather conditions.

The course of the index during recent months gives striking proof of the substantial recovery the textile trades have made since last winter. The decline in July was apparently only a temporary relapse. The volume of textile manufacture is now upon the level of the early fall of 1919, even when allowance is made for normal expansion of the trades. Textiles have been among the first to recover in 1921, just as they were among the first to collapse in 1920.

Of the two lines, cotton and wool, the latter has moved somewhat earlier throughout the cycle. The precipitate drop in wool manufacture occurred in 1920 four or five months earlier than the corresponding decline in cotton manufacture. More recently wool has shown a speedier recovery than cotton. As early as June the woollen and worsted trade was well back to normal; not until September was cotton manufacture on a similar level.

<sup>1</sup> The adjusted index here presented is a weighted arithmetic mean of relatives based upon two series: (1) raw cotton consumed; (2) wool consumed. The more elaborate methods employed in deriving the adjusted textile index in the Special Letter of October 22 give substantially the same results as shown in Chart 2 and Table B. The more refined analysis confirms the simpler but does not give enough better results to justify the greater effort. The data on woollen machinery will still be studied in interpreting the textile index, but the data will not for the present be incorporated in the index.



TABLE B. — ADJUSTED INDICES FOR THE TEXTILE GROUP AND FOR COTTON AND WOOL MANUFACTURE

Month	TEXTILE GROUP			COTTON			WOOL		
	1919	1920	1921	1919	1920	1921	1919	1920	1921
January .....	96.4	124.6	64.9	107.8	112.8	66.1	77.2	144.2	62.6
February .....	76.6	112.6	76.5	91.6	106.6	81.2	51.4	121.8	68.9
March .....	71.9	112.4	79.6	81.6	108.7	79.5	54.9	118.5	79.4
April .....	85.1	110.8	80.4	93.1	109.6	76.8	71.7	112.5	86.3
May .....	88.1	98.2	83.8	93.0	101.9	80.1	79.8	91.5	89.6
June .....	97.4	99.6	96.2	94.2	108.6	88.5	103.1	84.4	109.6
July .....	110.1	91.6	87.9	103.2	104.4	80.0	121.5	71.2	101.3
August .....	111.1	95.1	107.0	104.3	99.7	95.0	123.2	87.2	126.8
September .....	113.9	90.4	112.1	106.4	98.2	101.8	127.0	77.9	129.4
October .....	123.6	80.9	....	111.9	79.0	96.2	142.6	84.0	....
November .....	111.0	66.8	....	105.3	72.1	....	120.8	58.0	....
December .....	116.1	59.1	....	109.2	64.4	....	127.5	50.7	....

Examination of the available data would indicate that practically all sections of the textile trades have shared in the improvement since midsummer. True, the reports of active machinery hours show no significant increase in general woolen and worsted manufacture as compared with May-June. But wool consumption exhibits a marked rise, and carpet and rug manufacture seems to have experienced a steady improvement straight through from spring to September. The production of knit underwear likewise has shown a continuous increase and now is in larger volume relatively than at any time since the reporting service for this trade was inaugurated in early 1920. As a whole, manufacture in the textile trades was clearly in September upon a higher level than at any time since early 1920.

TABLE C. — SERIES INDICATIVE OF THE VOLUME OF TEXTILE MANUFACTURE IN 1921

Month	WOOLEN AND WORSTED GOODS Per cent of machinery hours reported active *					CARPETS AND RUGS	KNIT UNDERWEAR	FINISHED COTTON GOODS	SILK GOODS
	Sets of cards	Woolen spinning spindles	Combs	Worsted spinning spindles	Wide looms	Per cent of loom hours reported active*	Per cent of actual to normal production	Per cent of factory capacity operated	Consumption or raw silk in thousands of hales
January .....	33.9	31.6	37.1	34.8	33.3	42.5	16.4	33	22.2
February .....	35.7	35.5	49.0	44.7	40.0	36.5	28.0	51	16.5
March .....	49.4	49.5	73.8	62.1	54.7	36.1	50.1	67	25.6
April .....	64.2	65.9	88.7	74.3	61.7	35.7	49.6	66	28.9
May .....	75.0	77.1	94.6	86.5	73.4	38.0	55.4	68	27.2
June .....	80.2	81.4	98.6	89.6	80.1	44.1	65.5	74	33.8
July .....	82.1	81.8	95.9	93.4	82.5	47.1	51.2	62	32.3
August .....	79.4	80.0	87.4	85.7	79.2	42.1	71.1	71	32.8
September .....	78.9	78.8	91.2	88.5	76.7	57.4	84.4	75	31.2
October .....	79.0	79.1	97.6	92.2	74.2	65.5	....	....	....

\* As of the first of the month.

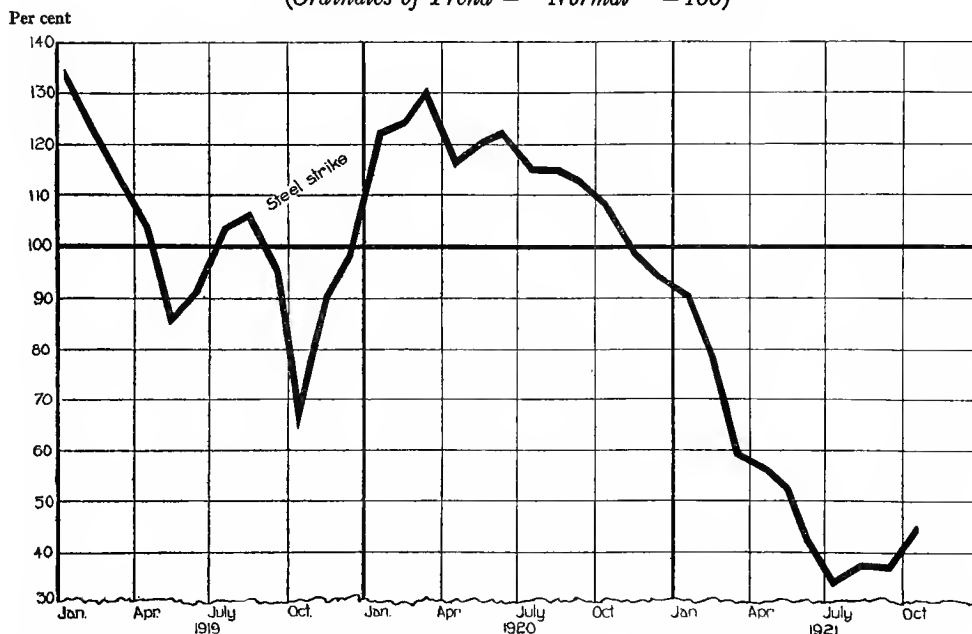
## THE IRON AND STEEL GROUP

Examination of the adjusted index for the textile group suggests the development of similar indices for other important divisions of industry. An adjusted index, corrected for long-time tendencies and seasonal variations, has already been obtained for the iron and steel trade. The index is given graphically in Chart 3, numerically in Table D.

The chart exhibits strikingly the cycle through which the iron and steel trade has passed since January 1919. The post-armistice reaction in this basic industry was slight, and almost immediately gave way to a strong upward tendency. This movement was broken

CHART 3. — ADJUSTED INDEX FOR THE IRON AND STEEL GROUP

(Ordinates of Trend = "Normal" = 100)



from September to December 1919, by a serious steel strike. During the first eight or nine months of 1920 the trade was unusually active. The slump in production was pronounced by November. It has since become one of the most serious setbacks ever experienced by the industry. Output last July was only about one-third of normal. The moderate increase of production since summer is little more than would be indicated at this season of the year, but is encouraging none the less as evidence that the trade is at last headed toward increased activity.

The adjusted index for iron and steel rests upon two important series: (a) monthly production of pig iron; (b) monthly production of steel ingots. The former is by far the most valuable single production series available in monthly form for the United States. The two series together furnish an unusually clear and dependable record of the course of production during recent years.

Monthly data on pig iron production are to be had from September 1901 to date.<sup>1</sup> The characteristic seasonal variation of the industry has been ascertained from the monthly data, September 1901 to December 1920. Upon the other hand, the normal growth of out-

<sup>1</sup> See "Current Statistics" for this series for recent months.

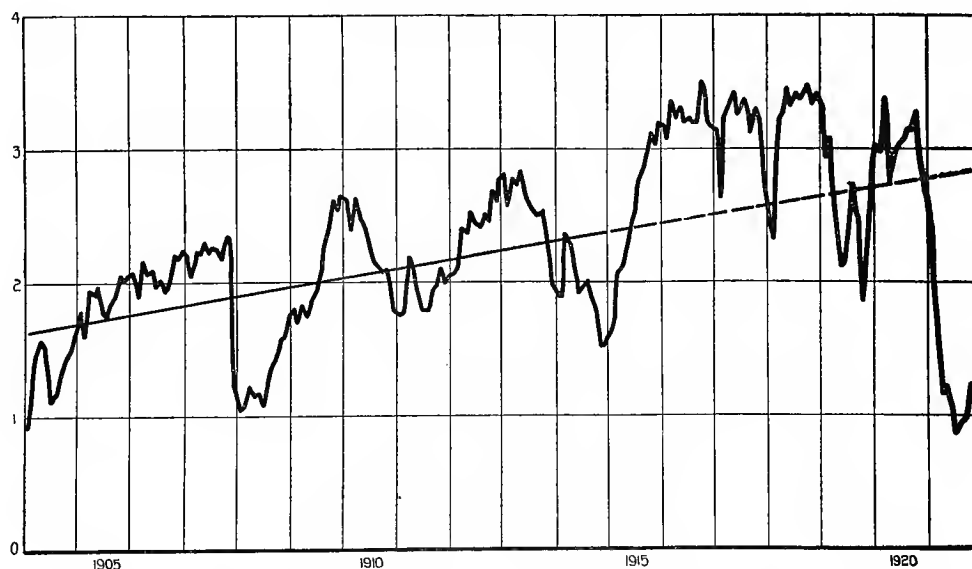
TABLE D. — ADJUSTED INDICES FOR THE IRON AND STEEL GROUP AND FOR IRON AND STEEL MANUFACTURE

Month	IRON AND STEEL GROUP			IRON			STEEL		
	1919	1920	1921	1919	1920	1921	1919	1920	1921
January .....	132.0	121.6	89.8	126.6	112.8	88.5	134.7	126.0	90.4
February .....	121.6	123.9	77.7	118.9	117.6	77.4	122.9	127.1	77.8
March .....	111.9	130.3	58.6	111.8	119.6	52.5	111.9	135.6	61.6
April .....	103.6	115.6	56.1	91.4	98.9	40.8	109.7	124.0	63.8
May .....	85.5	120.5	53.1	75.4	105.8	39.8	90.6	127.8	59.8
June .....	91.4	121.6	42.2	81.0	113.1	39.5	96.6	125.8	43.5
July .....	102.6	115.3	34.0	92.9	114.1	32.7	107.5	115.9	34.6
August .....	106.4	114.8	37.2	103.1	115.4	34.4	108.0	114.5	38.6
September .....	94.8*	112.7	37.0	94.8	115.8	36.9	†	111.2	37.1
October .....	66.1*	107.6	44.2	66.1	116.5	40.7	†	103.2	46.0
November .....	89.8*	99.4	....	89.8	107.5	....	†	95.3	....
December .....	97.9*	94.5	....	97.9	98.1	....	†	92.7	....

\* Based on pig iron only. † Data not available.

put has been determined from the 11-year pre-war period, 1904-14.<sup>1</sup> Both original monthly items and the line of trend are plotted in Chart 4. On the basis of the long-time trend and typical seasonal fluctuation of the trade, a normal output has been calculated for each

CHART 4. — MONTHLY PRODUCTION OF PIG IRON  
(in millions of long tons)



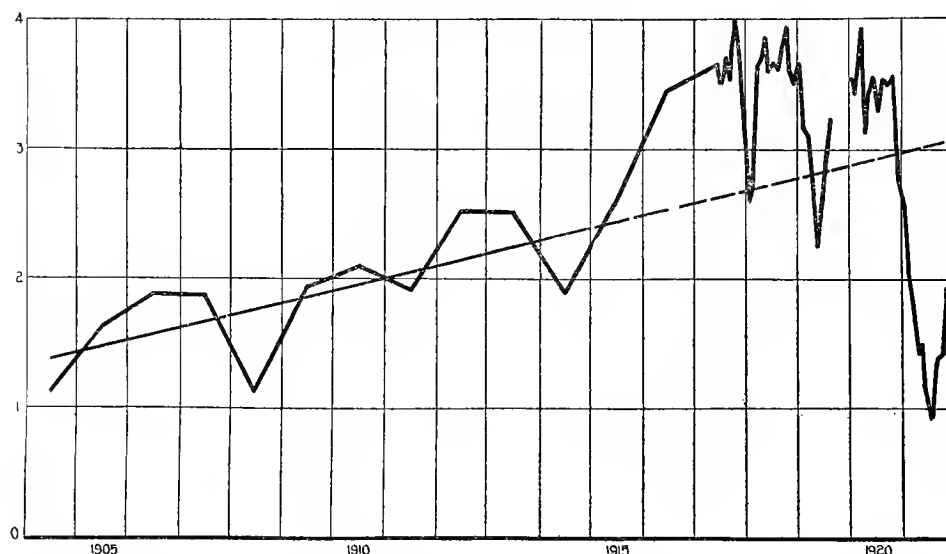
month. The figures for iron in Table D express actual production as a percentage of the normal output of the month.

Like methods have been followed in analyzing the data for steel ingot production. Monthly data in this case have been reported only since July 1917; but monthly average

<sup>1</sup> Full details regarding methods and results will be given in a later issue of the REVIEW OF ECONOMIC STATISTICS.

figures are available for a number of years before this. The normal growth of output in the industry has been calculated on the basis of the period 1905-14. The original data and the line of growth are shown in Chart 5. The percentages of actual to normal steel ingot production from January 1919 to October 1921 appear in Table D.

CHART 5. — MONTHLY PRODUCTION OF STEEL INGOTS  
(in millions of long tons)



Comparison of the percentage relatives of iron and steel in Table D shows that the two are nearly every month much the same. The adjusted index for the iron and steel group is a combination of the two constituents,<sup>1</sup> each already corrected for trend and seasonal variation. The cycle of the iron and steel trade is by this means presented in the simplest and clearest possible form.

<sup>1</sup> A weighted arithmetic mean, steel being given a weight of 2, iron a weight of 1.

HARVARD UNIVERSITY  
COMMITTEE ON ECONOMIC RESEARCH

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# THE VOLUME OF FOREIGN TRADE

*Special Letter—December 10, 1921*

THE spectacular expansion of our foreign trade induced by the war has been followed by an equally spectacular decline. Thoughtful observers would probably agree that during both the rise and the fall there has been a tendency in some quarters to overstate our foreign trade situation and its possibilities. Our views in the matter were stated in July 1919, when the REVIEW said: "We may venture the opinion that many of the claims and predictions regarding our new trading position are overoptimistic." A year later (April 1920) the fact was emphasized that we must soon expect a marked diminution in both terms of the balance; "the value figures will diminish with the deflation of prices." In the present year this diminution has occurred, and upon a striking scale; our combined exports and imports in the first ten months of the year have been about one-half of the total trade in the first ten months of 1920. The decline has been accompanied by a lengthy series of failures, particularly among inexperienced traders who had rushed into foreign trade as though it were a new El Dorado. This, too, is not without abundant precedent in business history and required no great sagacity to predict; every boom has left behind a similar trail of wreckage. Beyond the very general conclusion that our new creditor position will eventually mean a disappearance of our export balance, it is still much too early to attempt to assess, as though it were a completed episode, the net effect of the war and of our new commercial and financial relations with Europe and the neutral countries upon the future magnitude of American foreign trade or its relation to our domestic business problems. An analysis of our merchandise trade for the first three quarters of the present year, may be expected, however, to provide some useful further evidence.

In the retrospect, if there be occasion for surprise, it is not that the slump has come this year but that it was so long in coming. Probably the most difficult single fact to explain in American foreign trade in recent years was the pronounced expansion that occurred in the autumn months of 1920, analyzed in detail in the REVIEW's *Supplement* for June 1921. In spite of falling prices and the rapid decline of imports which had begun in September, the monthly average of exports, owing chiefly to a great increase in steel products and wheat, rose from \$611,000,000 in the third quarter to \$716,000,000 in the final quarter of last year. What has happened since that time is shown by the accompanying table. Combined exports and imports in the first nine months of the year fell from \$10,438,000,000 in 1920 to \$5,425,000,000 in 1921, a decrease of 48 per cent. Exports declined from \$6,080,000,000 to \$3,552,000,000, a fall of 42 per cent, and imports fell off from \$4,358,000,000 to \$1,873,000,000, a decrease of 57 per cent. The monthly averages for the quarterly periods indicate that imports have been diminishing in value since the spring of 1920, the pronounced decline beginning with the final quarter of last year, since when it has progressed virtually without interruption to the present time. The monthly average imports of the

## MONTHLY AVERAGES OF UNITED STATES FOREIGN TRADE IN 1920 AND 1921, FOR QUARTERLY PERIODS

(Units of \$1,000,000)

	Total trade	Exports	Imports	Balance
<b>1920</b> First quarter .....	1217	729	488	+ 241
Second " .....	1179	686	493	+ 194
Third " .....	1082	611	471	+ 140
Fourth " .....	1023	716	307	+ 409
<b>1921</b> First quarter .....	734	509	225	+ 284
Second " .....	551	336	215	+ 121
Third " .....	523	339	184	+ 155
Total trade Jan.-Sept. 1920 .....	10438	6080	4358	+ 1722
Total trade Jan.-Sept. 1921 .....	5425	3552	1873	+ 1679

third quarter of this year were only \$184,000,000, or but 37 per cent of the average monthly imports in the spring quarter of last year. The decline in exports occurred between December 1920 and April 1921, exports falling from \$720,000,000 in the former month to \$340,000,000 in the latter. Since last April exports have remained about stationary, varying between \$325,000,000 (July) and \$367,000,000 (August). In October, in spite of the fact that the harvest exports had begun, exports showed no upward tendency, amounting to but \$344,000,000, only 41 per cent of the exports of October 1920. Imports also remained weak, being only \$188,000,000.

## CHANGES IN QUANTITY

To determine the real significance of this reduction of our foreign trade to about one-half its former value, it is important to recall that the phenomenal growth which preceded it, culminating in exports of \$8,228,000,000 and imports of \$5,278,000,000 last year, the record figures in our history, was more in the value figures than in the physical volume of trade. It was chiefly the result of rapidly rising prices. In the fiscal year 1919, for instance, when export *prices* had increased 127 per cent over the 1911-14 average and *value* of domestic exports 217 per cent, the *quantity* of domestic exports had increased only 40 per cent over the pre-war average. Comparing year by year from the beginning of the war, the quantity exported increased steadily to 1917, when it was 71 per cent in excess of the 1911-14 average, declined in 1918 to but 25 per cent over the pre-war figure and partly recovered in 1919, when it was 40 per cent greater than before the war. These figures, which are for fiscal years, are indices based on 100 leading exports. Like most existent indices of the physical volume of exports, they are open to the criticism that in view of the violent changes in our export trade since 1914 no system of averages based, as these are, on pre-war conditions would be representative of post-war years. Therefore a new index based on 175 selected commodities, representing three-fourths of our exports in 1919, has been constructed to show the quantity of exports in the calendar year 1920 compared with 1919. This index is based upon the ratios of quantities of the 175 selected commodities exported in 1920 to the quantities exported in 1919. The computation shows that the

physical volume of exports in 1920 was 94.1 per cent of the volume exported in 1919. In other words, there was a fall of 5.9 per cent in the quantity of exports last year compared with the preceding year. An index, similarly constructed, but based on 50 selected commodities comprising 63 per cent of the exports in 1920,<sup>1</sup> shows that the physical volume of exports in the first three quarters of this year was 94.0 per cent of the quantity exported in the same period last year.<sup>2</sup>

A similar index for physical volume of imports has not yet been computed, since this is a task of somewhat greater difficulty by reason of the greater number and diversity of products. The foreign trade index of the Federal Reserve Board, however, places physical quantity of imports in 1919 at 171.1 per cent of the 1913 figure, and the quantity imported in 1920 at 171.7 per cent, indicating that last year there was virtually no change from 1919. For the first nine months of 1921 its index shows a fall of about 32 per cent in volume of imports compared with the same period of 1920. From this index it appears that the increase in physical volume of imports down to last year was even greater than that in exports, though the increase in the value figures was much less than for exports; and that in the present year the import trade has fallen off much more sharply, both in value and in quantity, than has the export trade. In the absence, however, of an index of physical volume of imports constructed by the methods used in our new index of physical volume of exports, this conclusion must be taken as tentative.<sup>3</sup>

Our indices of physical volume of exports make clear a most interesting fact. In volume exported, the decline this year has apparently been no greater than it was in 1920. In both 1920 and 1921 it amounted to about 6 per cent. But in 1920 the fall was covered up by a 4 per cent increase in the total value of exports, from \$7,920,000,000 in 1919 to \$8,228,000,000 last year, whereas in the present year the decline in volume has been accompanied by a fall of 42 per cent in value. In other words, the pronounced decline of our export trade this year has been for the most part but the expression of falling prices. According to the price indices for "exported goods" and "imported goods" prepared by the Federal Reserve Board, though both sets of prices turned downward after April 1920, export prices were 6 per cent and import prices 10 per cent higher in 1920 than the averages for the year 1919. In the first nine months of the present year, on the other hand, the monthly average of

<sup>1</sup> The 50 commodities were 63.1 per cent of total exports in the first nine months of 1920, and 64.7 per cent of the total in the first nine months of 1921.

<sup>2</sup> The formula for the index is as follows:

$$I_1 = \frac{\sum p_{1920} q_{1921}}{\sum p_{1920} q_{1920}}$$

$$I_2 = \frac{\sum p_{1921} q_{1921}}{\sum p_{1921} q_{1920}}$$

$$I = \sqrt{I_1 I_2}$$

This is the Fisher formula. In the absence of price data, it was necessary to work with values and quantities. The formula was therefore thrown into the following form.

$$I_1 = \frac{\sum v_{1920} \frac{q_{1921}}{q_{1920}}}{\sum v_{1920}} = 98.1$$

$$I_2 = \frac{\sum v_{1921}}{\sum v_{1921} \frac{q_{1920}}{q_{1921}}} = 90.0$$

$$I = \sqrt{I_1 I_2} = 94.0$$

<sup>3</sup> The Reserve Board's index of physical volume of imports includes 25 of the most important imports, the value of which in 1913 formed 47.7 per cent of the total import values. Being computed on the year 1913 as base and with the import values of 1913 as weights, it is subject to the cautions mentioned above in discussing quantity indices of exports, as also to the criticism that it is not very comprehensive.

export prices fell 48 per cent compared with the same period of last year, and the monthly average of import prices fell 49 per cent. In the same period, according to the Reserve Board's index, general prices have fallen 41 per cent below the average for the first nine months of last year. Apparently both on the rise and on the fall the variation in export and import prices has been more pronounced than that in general prices. Export and import prices rose faster and higher, and since their turn in April 1920 have fallen further and more sharply. This fact would tend, of course, to accentuate the decline in value of exports and imports.

## CHANGES BY GROUPS AND PRINCIPAL COMMODITIES

Both in value and in quantity the changes in the great groups of exports and imports this year have been more striking than the changes in the total trade. In exports the losses have been heaviest in raw materials and in manufactures, the former falling 51 per cent and the latter 47 per cent below their value in the first nine months of 1920. Total food products, on the other hand, have fallen but 24 per cent, and crude foodstuffs have declined only 3 per cent. In imports the decline has been heavy in all three groups, but has been most severe in food products, which fell 66 per cent, while raw materials declined 58 per cent and manufactures 46 per cent. The result has been to bring about a marked alteration, both in exports and imports, in the relative importance of the three groups of products

### EXPORTS BY GROUPS, JANUARY-SEPTEMBER INCLUSIVE, 1920 AND 1921

Groups	ABSOLUTE FIGURES		PERCENTAGE OF TOTAL		Decrease in 1921	
	1920	1921	1920	1921		
	<i>millions</i>	<i>millions</i>	<i>per cent</i>	<i>per cent</i>	<i>millions</i>	<i>per cent</i>
Raw materials .....	\$1397	\$684	23.0	19.3	\$713	51.0
Food products .....	1489	1136	24.5	32.0	353	23.7
Manufactures .....	3069	1637	50.4	46.1	1432	46.7
Total exports * .....	\$6080	\$3552	100	100	\$2528	41.6

\* Including "miscellaneous" and "foreign" exports.

### IMPORTS BY GROUPS, JANUARY-SEPTEMBER INCLUSIVE, 1920 AND 1921

Groups	ABSOLUTE FIGURES		PERCENTAGE OF TOTAL		Decrease in 1921	
	1920	1921	1920	1921		
	<i>millions</i>	<i>millions</i>	<i>per cent</i>	<i>per cent</i>	<i>millions</i>	<i>per cent</i>
Raw materials .....	\$1515	\$630	34.8	33.6	\$885	58.4
Food products .....	1487	512	34.1	27.3	975	65.6
Manufactures .....	1331	717	30.5	38.3	614	46.1
Total imports * .....	\$4358	\$1873	100	100	\$2485	57.0

\* Including "miscellaneous" imports.



which comprise international trade. In exports, manufactures and raw materials have declined in importance, and food products, which last year were one-fourth of total exports, are this year one-third of the total. In imports the realignment of the groups has been even more pronounced, manufactures gaining markedly in relative importance at the expense of food products. Raw materials have continued to constitute about a third of the total. It is interesting to note, moreover, that all of these changes run directly counter to the main tendencies of the pre-war period, which were, for exports, the marked increase (since about 1900) of exports of manufactures and the decline in relative importance of food products, and for imports the increase in food products and raw materials at the expense of manufactures. The evidence from the war and early post-war periods was that these tendencies were in no respect fundamentally altered but for the most part intensified; the present year, therefore, represents the first important upset of the preëxisting tendencies in the character of our trade. Whether this interruption possesses any lasting significance or is merely a vagary of the present depression period it is too early to venture any opinion. As was stated in the *Supplement* of last June, however, it may well be that our new creditor position, entailing as it must an increased inflow of goods from Europe as a means of debt payment, will check for a time the pre-war tendency of manufactured imports to decline in importance. The very marked reduction in food imports is doubtless for the most part the reaction from the heavy imports last year, at greatly inflated prices, of Cuban sugar. In the first nine months of 1920 imports of sugar alone amounted to \$887,000,000, or over one-fifth of the total imports; in the first nine months of this year sugar imports amounted to but \$204,000,000, or 11 per cent of the total imports. While sugar imports have thus fallen 77 per cent in value, their quantity has diminished 32 per cent.<sup>1</sup>

The group changes in exports are best explained by reference to the detailed table, on the final page of this *Letter*, of quantity and value changes in the principal commodities exported in the first nine months of this year. Of the thirteen important exports which increased in quantity, compared with the same period last year, six were food products and five, raw materials; only two were manufactured products. The increases in crude foodstuffs were phenomenal, in some cases surpassing all recent records. Corn exports increased 813 per cent in quantity and 300 per cent in value, notwithstanding the fact that the price dropped from 96 cents a bushel in January to 60 cents a bushel in September. Exports of wheat increased 82 per cent in quantity and 4 per cent in value, though the price dropped from \$2.13 per bushel in January to \$1.34 in September. Lard increased in quantity 69 per cent, barley 82 per cent, rice 66 per cent, and hams and shoulders 25 per cent. These figures indicate sufficiently why, while the other great groups were reduced in value about one-half, total food products, in spite of heavily falling prices, diminished in value but 24 per cent, and crude foodstuffs but 3 per cent. On the other hand, of the twenty leading exports which have decreased in quantity this year all but four were manufactures or raw materials. Especially marked are the declines in steel products, automobiles, oil products, coal, and cotton textiles. As pointed out in the last *Special Letter*, the slump in iron and steel production which became pronounced in the autumn of 1920 has "this year become one of the most serious setbacks ever experienced by the industry. Output last July was only about one-third of normal." This decline has been markedly reflected in the

<sup>1</sup> From 6,970,000,000 lbs. in the first nine months of 1920 to 4,748,000,000 lbs. in the same period of 1921.

export trade, the steel group showing declines in quantity in the first nine months of this year which ranged from 18 per cent for structural steel to 65 per cent for bar iron.

## THE BALANCE OF TRADE

While the value figures of trade have declined so sharply this year it is a significant fact that the trade balance has shown no essential change. For the first nine months of 1920 the excess of exports was \$1,722,000,000, and for the same period of this year it was \$1,679,000,000. Indeed on a relative basis the trade balance has increased strikingly in our favor. In the first nine months of last year the balance was 17 per cent of the combined exports and imports; in the same period this year it was 31 per cent of the total trade. There is as yet therefore no apparent tendency for our export balance to disappear as the logical eventual outcome of our new creditor position. It seems clearer than ever that, as stated in previous studies in the REVIEW, there will be no radical disturbance of the trade balance until Europe begins the payment of the interest charges, now amounting to about \$522,000,000 a year, upon our government's credits advanced during the war and the early post-war period. What arrangement of these payments will be made by the present administration, and what relation the whole subject will bear to tariff policy, will be watched with interest during the new session of Congress, which is expected to consider both the permanent tariff bill and that on debt refunding.

The accompanying table shows the changes in exports and imports and the balance of trade by continents in the first nine months of 1921. In the trade with Europe the relative

THE TRADE BALANCE BY CONTINENTS, JANUARY-SEPTEMBER INCLUSIVE, 1920 AND 1921

Countries	EXPORTS		IMPORTS		BALANCE	
	1920	1921	1920	1921	1920	1921
	<i>millions</i>	<i>millions</i>	<i>millions</i>	<i>millions</i>	<i>millions</i>	<i>millions</i>
Europe .....	\$3297	\$1861	\$991	\$555	+\$2306	+\$1306
North America .....	1418	919	1371	593	+ 47	+ 326
Asia .....	629	355	1064	407	- 435	- 52
South America .....	432	228	638	224	- 206	+ 4
Oceania .....	187	130	152	67	+ 35	+ 63
Africa .....	117	60	143	26	- 26	+ 34
Totals .....	\$6080	\$3552	\$4358	\$1873	+\$1722	+\$1679

Countries	DECLINE OF EXPORTS		DECLINE OF IMPORTS		RATIO OF TRADE BALANCE TO TOTAL TRADE	
	<i>millions</i>	<i>per cent</i>	<i>millions</i>	<i>per cent</i>	1920	1921
Europe .....	\$1436	43.5	\$436	44.0	53.8	54.0
North America .....	499	35.2	778	56.8	1.7	21.6
Asia .....	274	43.5	657	61.7	-25.7	-6.8
South America .....	204	47.2	414	64.9	-19.2	0.9
Oceania .....	57	30.5	85	56.0	10.3	32.0
Africa .....	57	48.7	117	81.8	-10.0	39.5
Totals .....	\$2527	41.6	\$2485	57.0	16.5	30.9

declines in exports and imports compared with the same period of last year have been about equal, being 44 per cent in each case, and the ratio of the trade balance to the total trade has remained unchanged, though in absolute figures the decline has been almost one-half, from \$2,306,000,000 last year to \$1,306,000,000. In the trade with North America imports have diminished much more markedly than exports, owing particularly to the decline in imports of sugar from Cuba; as a result our excess of exports has increased from \$47,000,000 to \$326,000,000. With Asia and Latin America also, our imports have decreased much more markedly than our exports, reducing our adverse balance with Asia from \$435,000,000 last year to \$52,000,000 this year, and giving us for the first year since before the war a favorable balance in the Latin-American trade. From this brief summary it is evident that the relatively large trade balance this year has been due mainly to the reduction of our imports from the non-European countries; except for price deflation, affecting about equally our European exports and imports, our balance with Europe this year has not exerted much effect upon the total trade balance.

### RECENT TENDENCIES

So far as the value figures of trade are concerned, there is little evidence that we have yet "turned the corner" in foreign trade. There is no evidence from the data that the decline of imports has terminated. The fact that exports have shown no further tendency to decline since last spring may indicate that the downward movement has come definitely to an end, though the failure of exports to show any expansion in September and October, despite the appearance of the new harvest, leaves the question in considerable doubt. The outstanding conclusion from the present analysis, however, is that the value figures of trade are a most uncertain indication of what is really happening, since they are dominated by the change of prices. As already stated, the decline in physical volume of exports this year has been but 6 per cent, a decline no greater than that of last year. Relating these changes to those given in a previous section for the war and the early post-war period, the quantity of exports in the first nine months of this year would still be about one-fifth greater than the pre-war average (1911-14). The most satisfactory indication of recent tendencies in exports would be given by a monthly index of physical volume exported. According to the foreign trade index of the Federal Reserve Board, the physical quantity of exports reached its lowest point in April 1921, when it was about 10 per cent below the average for 1913. From April to August there was a strong upward tendency, bringing the index for August to 41 per cent above the 1913 average. This rise was due chiefly to the spectacular increase during the summer months in lard, wheat, corn, and other food products. In September, however, the latest month for which the index has been computed, there was another decline, of about 15 per cent. In imports, the tendency has been downward throughout the year. From these indices it appears probable that we have passed the low point of exports, though there can be no marked advance until manufactured exports, and particularly steel products, follow food products and raw materials upward. In imports there is no evidence, in either the value or the quantity figures, that the low point has yet been reached.

QUANTITIES AND VALUES OF THE PRINCIPAL EXPORTS, JANUARY-SEPTEMBER INCLUSIVE,  
1920 AND 1921

*Exports which Increased in Quantity in 1921*

	VALUES		QUANTITIES			Ratio of quantities 1921/1920
	1920	1921	Unit	1920	1921	
	millions	millions	millions			per cent
Corn .....	\$19	\$78	bu.	11.5	105.0	913
Wheat .....	368	381	bu.	130.5	237.4	182
Lard .....	99	93	lbs.	410.7	695.7	169
Cotton, raw .....	862	317	lbs.	2101.8	2226.2	106
Hams and shoulders .....	41	40	lbs.	150.8	187.9	125
Tobacco leaf .....	192	168	lbs.	356.2	403.9	113
Cotton seed oil .....	25	22	lbs.	113.0	220.3	195
Pipes and fittings .....	35	52	lbs.	530.8	785.1	148
Barley .....	18	17	bu.	11.2	20.4	182
Rice .....	32	17	lbs.	294.1	489.4	166
Fuel and gas oils .....	37	39	gals.	587.6	665.7	113
Crude oil, mineral .....	21	17	gals.	250.8	282.7	113
Cotton cloths, unbleached .....	34	16	yds.	125.3	160.1	128

*Exports which Decreased in Quantity in 1921*

Bacon .....	\$115	\$61	lbs.	460.1	354.7	77
Wheat flour .....	183	95	bbls.	16.2	13.0	80
Rye .....	95	40	bu.	43.9	25.2	57
Sugar, refined .....	86	43	lbs.	851.3	786.0	92
Boards, deals, etc. ....	76	32	M ft.	1.22	.82	67
Cotton cloths, colored .....	108	28	yds.	370.5	172.2	46
Cotton cloths, bleached .....	43	9	yds.	153.7	61.4	40
Coal, bituminous .....	197	107	tons	23.6	17.5	74
Copper, ingots .....	92	56	lbs.	460.5	417.6	91
Oil, lubricating .....	108	70	gals.	293.4	195.4	67
Oil, illuminating .....	95	73	gals.	621.9	532.8	86
Naphthas .....	126	104	gals.	470.4	403.5	86
Locomotives, steam .....	42	25	No *	1.30	.79	61
Automobiles, commercial .....	35	9	No *	22.11	5.94	27
Steel, sheets and plates .....	79	41	lbs.	1,923.8	1,031.9	54
Iron, other bars .....	39	13	lbs.	1,028.6	362.9	35
Steel rails .....	25	17	tons	.421	.282	67
Tin plates .....	30	15	lbs.	380.2	189.7	50
Structural steel .....	25	24	tons	.33	.27	82
Steel wire, not barbed .....	16	8	lbs.	283.7	130.6	46

\* Unit 1,000.

HARVARD UNIVERSITY  
COMMITTEE ON ECONOMIC RESEARCH

# THE VOLUME OF MANUFACTURE

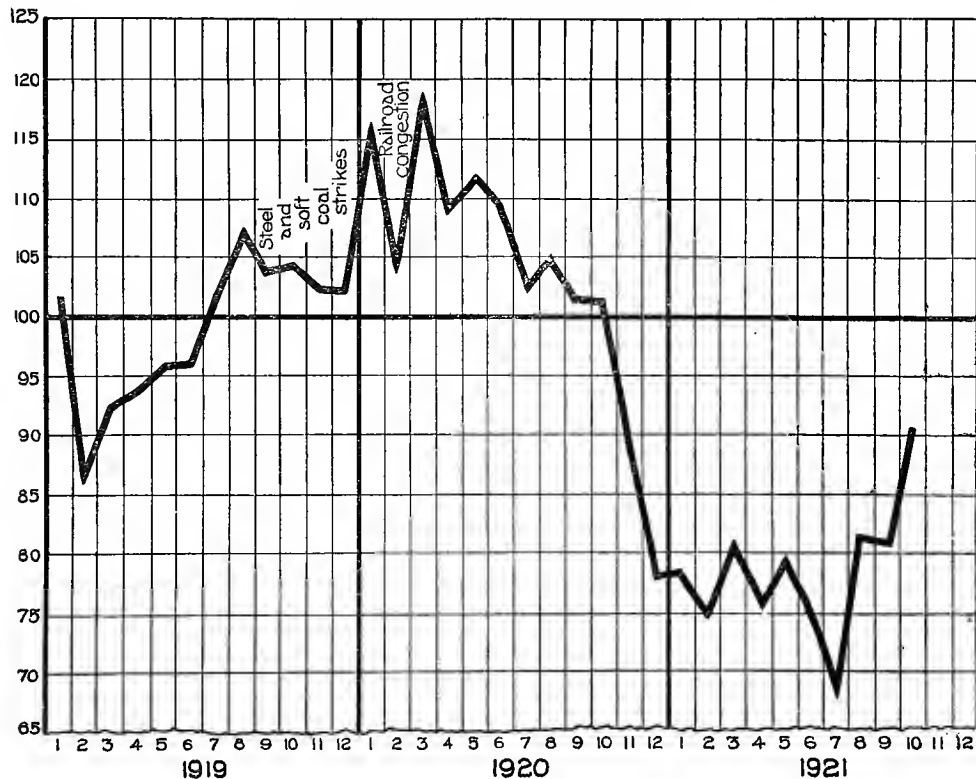
INDEX FOR ALL GROUPS COMBINED  
ADJUSTED INDICES FOR IRON AND STEEL, TEXTILES, AND PAPER

*Special Letter—December 24, 1921*

## ALL GROUPS COMBINED

**M**ANUFACTURE is no exception to the rule that business conditions after depression tend to become spotty. Liquidation and price readjustment are more quickly effected in some trades than in others and the possibilities of early recovery vary widely. For these reasons it is difficult to generalize about such periods as the past four months. That there has been substantial improvement in some industries is obvious. It is just as

CHART I. — INDEX OF THE VOLUME OF MANUFACTURE  
(1919 Monthly Average = 100)



clear, however, that other lines have merely held their own, or, at most, have shown an increase of activity no more than seasonal. Still others have receded somewhat. The general tendency is not easily ascertained. Upon the whole, however, it would appear that the volume of manufacture has shown a real increase during recent months.

TABLE A. — MONTHLY INDICES OF THE VOLUME OF MANUFACTURE FOR EIGHT GROUPS OF MANUFACTURING INDUSTRIES AND FOR THE GROUPS COMBINED

(1919 Monthly Average = 100)

Month	All groups	Iron and steel	Lumber	Paper	Petroleum	Textiles	Leather	Food	Tobacco
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<b>1919</b> January....	101.6	130.1	75.5	93.0	89.7	96.5	109.4	114.9	87.3
February ..	86.7	113.7	75.8	82.8	83.8	72.7	91.0	87.3	83.8
March.....	92.6	113.5	88.8	87.0	92.8	79.0	92.8	92.1	97.7
April.....	93.7	94.6	97.8	88.4	92.4	92.9	108.7	92.8	82.0
May.....	95.7	81.2	112.1	95.1	100.7	99.2	106.3	98.5	88.0
June.....	95.9	90.9	103.5	98.3	96.1	100.2	108.6	83.8	92.9
July.....	101.9	103.1	103.7	103.3	103.7	109.4	99.8	85.9	99.3
August....	107.2	113.5	123.4	108.8	107.4	103.4	102.6	88.4	101.1
September .	103.8	97.6	113.8	106.2	108.3	105.3	102.0	97.7	108.6
October....	104.4	73.2	123.4	116.4	112.0	119.3	101.4	111.0	125.4
November .	102.2	94.0	102.0	108.6	107.0	104.9	87.4	109.0	117.0
December..	102.1	103.4	80.1	109.8	107.6	110.1	89.9	108.6	113.0
<b>1920</b> January ...	115.9	124.2	101.1	120.9	102.3	126.6	90.8	112.2	115.7
February ..	104.6	120.5	101.3	105.8	97.0	110.5	81.6	85.3	98.9
March.....	118.0	138.3	117.4	119.5	111.6	121.0	94.0	90.8	123.1
April.....	108.8	111.0	122.3	121.7	109.3	119.3	84.7	75.9	107.8
May.....	111.8	121.2	127.3	119.2	115.0	110.5	90.9	85.1	111.1
June.....	109.6	124.9	115.4	122.5	115.9	104.1	95.2	80.8	114.6
July.....	102.3	118.0	103.1	123.0	122.9	92.8	80.7	80.8	98.1
August....	104.9	125.3	117.8	122.5	132.2	88.2	70.5	83.4	104.8
September .	101.4	125.0	108.7	119.3	134.6	83.4	73.3	78.0	105.0
October....	101.2	126.7	108.1	119.7	135.2	78.7	77.8	81.1	106.3
November .	88.9	111.3	86.2	108.0	131.2	62.1	70.1	91.0	93.1
December..	77.9	99.5	62.8	94.6	134.6	54.5	72.1	88.4	73.5
<b>1921</b> January ...	78.3	92.7	59.5	84.3	131.6	68.1	63.5	84.1	88.7
February ..	75.0	73.7	65.3	78.5	115.0	76.3	62.8	74.4	95.0
March.....	80.6	65.2	78.2	83.2	117.9	89.3	72.0	85.6	106.6
April.....	75.8	50.5	84.6	79.3	124.9	89.3	75.8	82.4	96.6
May.....	79.3	52.4	100.7	73.6	122.8	96.2	83.2	79.9	100.6
June.....	75.9	42.3	92.8	75.6	122.7	100.8	81.1	82.7	108.0
July.....	68.5	34.0	86.8	71.0	119.7	89.5	76.3	84.5	101.8
August....	81.5	46.0	101.5	84.4	119.7	100.7	85.7	96.7	118.3
September .	81.0	47.4	89.8	88.2	118.2	105.7	80.3	91.6	113.1
October....	90.6 *	64.0	....	98.0	....	110.6	....	97.9	117.2
November..	....	67.0	....	....	....	....	....	....	....

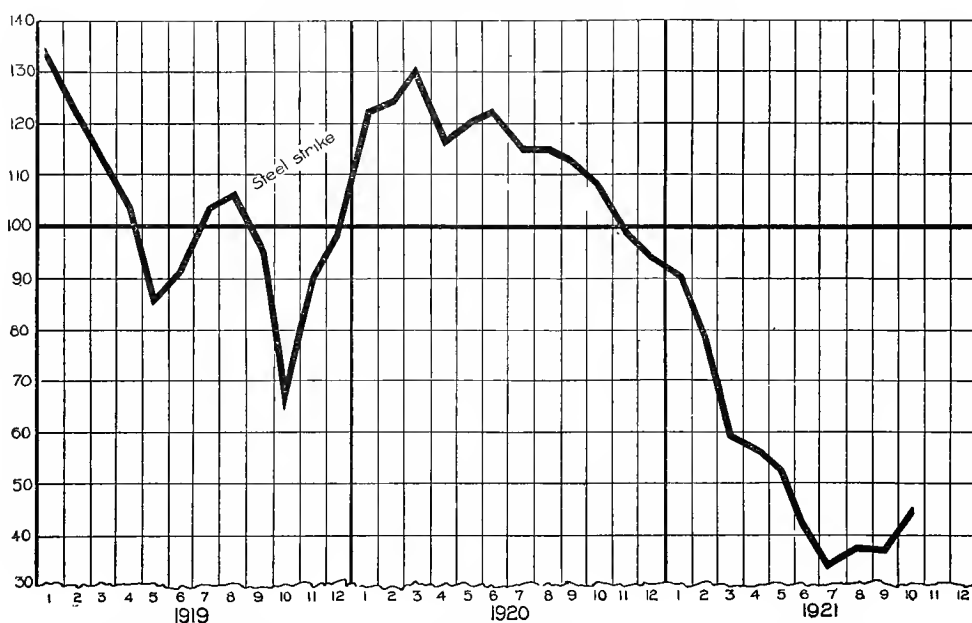
\* Subject to revision.

The general movement of industrial activity is best shown by the Index of the Volume of Manufacture, appearing above. The Index touched bottom (68.5) last July. It rose in August to 81.5, reflecting a decided increase in industrial output. In September there was no appreciable change, but in October a further rise to about 90.6 was recorded. Current

reports would indicate no material advance since October. But it is significant that there has been no serious retrogression. Ground once gained has been held. And though there are in some lines factors which may cause hesitation, and possibly moderate relapses, the forces making for increased production appear to be continually gathering strength. At this period of the year a slight decline in industrial output will not be surprising. But at bottom conditions seem to be improving, and manufacturing enterprise should be in position to take full advantage of the favorable impulses of the spring.

Since, as already stated, the situation during recent months has been spotty, it is desirable to examine with care conditions in the several groups of industries, and to consider especially whether any changes observed are more than seasonal movements characteristic of the several trades during the fall months. The iron and steel industry may well be examined first. Activity in this industry is shown in the adjusted index appearing in Chart 2 and Table B. In the construction of the index full allowance has been made for the normal expansion and customary seasonal variations of the trade; the cyclical movement is

CHART 2. — ADJUSTED INDEX FOR THE IRON AND STEEL GROUP  
(Ordinates of Trend = "Normal" = 100)



thrown into bold relief. The index shows clearly that the increase in iron and steel production since July has been more than seasonal. In July the industry was operating at about one-third its normal rate for that month; in October it was operating at a rate about 45 per cent of normal for October. November brought a further advance which raised output to slightly more than half of normal. While new orders have been falling off somewhat and many concerns appear to be waiting until after the opening of the new year before making further commitments, there are encouraging evidences of a larger demand for heavy steel for railroad and construction requirements. Should such a demand develop in the early future, the industry may make a quick recovery, for the demand for light steel is already upon a level which is satisfactory, considering general business conditions.

The textiles are another important group for which an adjusted index is at hand. The index is given graphically in Chart 3, and numerically in Table B. The index shows clearly the improvement which has taken place in textile manufacture since last winter. Furthermore, it is obvious that the increase in output since mid-summer has been much more than a seasonal movement. The index for October, however, discloses no general improvement over September, an increase in wool manufacture being offset by a decline in cotton manufacture. In November, a decided increase in the mill consumption of raw cotton seems to have taken place.<sup>1</sup> Figures for November 1 from practically all the textile trades except

CHART 3. — ADJUSTED INDEX FOR THE TEXTILE GROUP

(Ordinates of Trend = "Normal" = 100)



silk suggest increased manufacturing activity — most decided in the production of carpets and rugs. Textile manufacturing as a whole seems to be more than holding its own. Recently it has shown a volume well above the average indicated by pre-war tendencies.

Conditions in the paper trade continue to improve. In the final section of this letter an adjusted index of the volume of paper manufacture is developed. The increase in output since mid-summer has been notable. Part of this increase has been seasonal. But when due allowance has been made for seasonal influences — as is done in constructing the adjusted index — a decided increase remains. In July, the low month of the depression, the index stood at 63.4. By October, it had risen to 80.6. As a whole, the paper trade appears to expect an early recovery of normal activity.

Recent weeks have witnessed some uncertainty about output in the group of industries turning out food — wheat flour milling, meat slaughtering, and sugar refining. The *unadjusted* index for the group (see column 8 of Table A) shows output from August to October distinctly above the level of the earlier months of the year, and not far below the monthly average of 1919. The question is whether this recent increase has been more than seasonal. An adjusted index, provisionally calculated,<sup>2</sup> would indicate that output was relatively

<sup>1</sup> Because of a decline in orders this has resulted in an accumulation of stock at the mills.

<sup>2</sup> The index will be presented in full next month.



much larger in August than in any month since. Production in October, when seasonal variation is taken into account, seems to have been less than in any other month since May. July, August, and September were upon a somewhat higher level than the first six months of the year; October, while showing a volume distinctly above that of October, 1920, fell distinctly below the output of the late summer and early fall.

Changes in the other groups are not so noteworthy. While complete data are not yet in hand for October, it is probable that the group index for lumber will show a moderate rise, for petroleum products, a slight fall. Leather production was somewhat greater in October than in September though the increase evidences no material change in the condition of this trade. Tobacco manufacture in October almost reached the high level of August, and stood nearly one-fifth above the 1919 monthly average. These four groups are similar in that no one of the four showed any increase of output between August and October. Had not other more important groups — previously discussed — showed a decided gain during the fall, it would be difficult indeed to offer any favorable characterization of recent tendencies. Even as it is, any such characterization must be used with appropriate recognition of the contrasts which feature the present industrial situation.

TABLE B. — ADJUSTED INDICES FOR THE IRON AND STEEL, TEXTILE, AND PAPER GROUPS\*  
(Ordinates of Trend = 100)

Month	IRON AND STEEL GROUP			TEXTILE GROUP			PAPER GROUP		
	1919	1920	1921	1919	1920	1921	1919	1920	1921
January .....	132.0	121.6	89.8	96.4	124.6	64.9	98.2	121.9	84.3
February .....	121.6	123.9	77.7	76.6	112.6	76.5	96.9	116.2	87.1
March .....	111.9	130.3	58.6	71.9	112.4	79.6	91.9	120.1	82.2
April .....	103.6	115.6	56.1	85.1	110.8	80.4	91.9	120.7	78.4
May .....	85.5	120.5	53.1	88.1	98.2	83.8	95.5	115.3	69.2
June .....	91.4	121.6	42.2	97.4	99.6	96.2	96.6	116.2	68.7
July .....	102.6	115.3	34.0	110.1	91.6	87.9	100.1	115.3	63.4
August .....	106.4	114.8	37.2	111.1	95.1	107.0	101.6	110.6	71.7
September .....	94.8 †	112.7	37.0	113.9	90.4	112.1	103.2	111.9	79.4
October .....	66.1 †	107.6	44.3	123.6	80.9	112.9	105.6	104.5	80.6
November .....	89.8 †	99.4	53.6	111.0	66.8	....	106.2	102.4	....
December .....	97.9 †	94.5	....	116.1	59.1	....	116.7	99.5	....

\* See Table C for the constituent series.

† Based on pig iron only.

## THE PAPER GROUP

The adjusted index — shown in Chart 4 and Table B — exhibits clearly the cycle through which the paper industry has passed since January 1919. Typical seasonal movements and the normal growth of the industry have been eliminated. Comparison of the index with the corresponding indices for the iron and steel and textile groups discloses a number of highly significant points. There is striking similarity in the general character of the curves for paper and iron and steel. In both these trades, the post-armistice slump was followed by a rapid upward movement culminating in early 1920; in both there was no

precipitate decline until the final quarter of 1920; in both, the depths of depression were not experienced until last summer. Upon the other hand, paper differs strikingly from iron and steel in the violence of the fluctuations of output. Relatively, paper production rose only about two-thirds as high in 1920 and fell only half as low in 1921. In this respect, paper has behaved much more like the textiles than like iron and steel.

The paper index rests upon adjusted relatives of five series giving the monthly production of the major varieties of paper: newsprint, book paper, fine paper, wrapping paper, and paper board. The series have been published by the Federal Trade Commission for the months from January 1918 to date. Earlier monthly data for newsprint are to be found in the files of the *Paper Trade Journal*. These have been used, as well as data from the

CHART 4. — ADJUSTED INDEX FOR THE PAPER GROUP

(Ordinates of Trend = "Normal" = 100)



Federal Censuses of Manufactures for 1899, 1904, 1909, and 1914, in determining the different trends of output.<sup>1</sup> The original series and lines of trend appear in the several diagrams of Chart 5.<sup>2</sup>

Examination of Chart 5 demonstrates beyond question that the five paper series are of the same family. It is clear, however, from the plots for 1918, that the several members of the family were affected differently by the exigencies of the war. And the different lines have rebounded differently from the depression of last summer. Wrapping paper and paper board — the courser papers — have made greater relative gains than book and fine paper. Newsprint, as might be expected, has shown throughout the period less extreme fluctuations than the other members of the group. Despite the differences noted, however, the five series combined afford an unusually reliable record of the course of manufacturing output in the paper trade as a whole from January 1919 to date.

<sup>1</sup> Full details of the methods employed will be presented in a later issue of the REVIEW OF ECONOMIC STATISTICS.

<sup>2</sup> Wood pulp also is shown though it is not included in the index. Adjusted relatives of the five paper series are given in Table C.

CHART 5.—SERIES INDICATIVE OF THE VOLUME OF PAPER MANUFACTURE

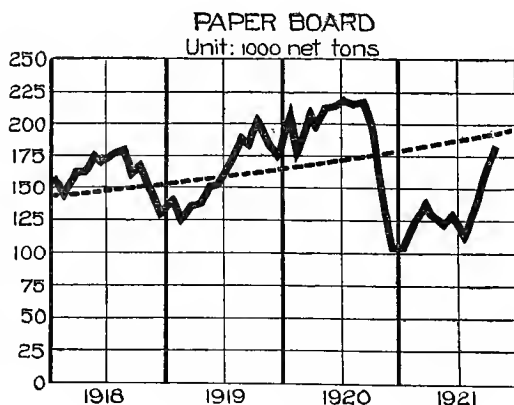
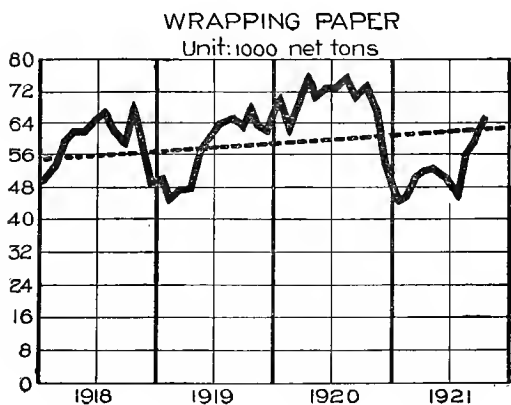
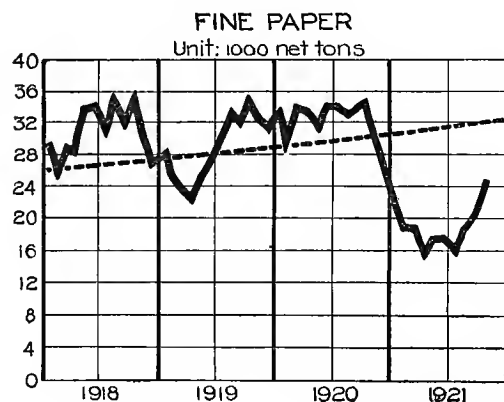
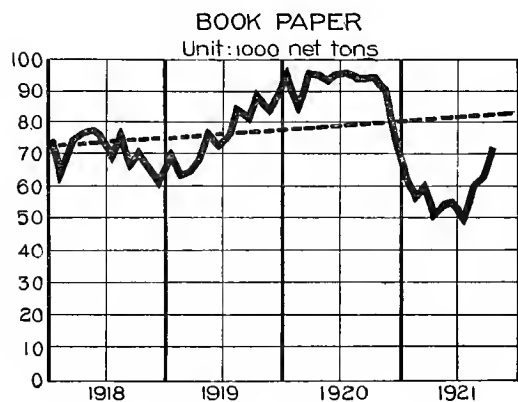
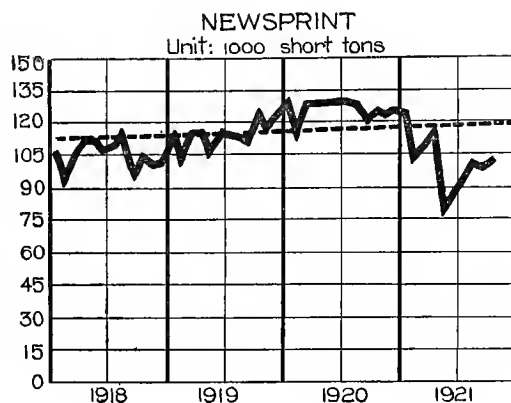
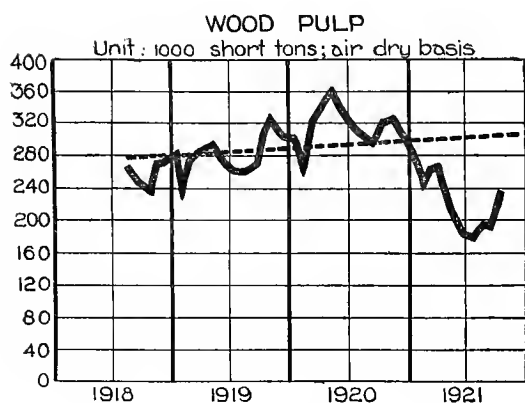


TABLE C. — ADJUSTED RELATIVES OF SERIES INDICATIVE OF THE VOLUME OF MANUFACTURE \*

(Ordinates of Trend = 100)

Month	IRON AND STEEL		TEXTILES		PAPER				
	Pig iron produced	Steel ingots produced	Raw cotton consumed	Raw wool consumed	Newsprint produced	Book paper produced	Fine paper produced	Wrapping paper produced	Paper board produced
1919 January ...	126.6	134.7	107.8	77.2	97.7	93.0	104.1	100.6	98.4
February ..	118.9	122.9	91.6	51.4	99.0	94.8	104.2	93.9	95.9
March ....	111.8	111.9	81.6	54.9	98.7	86.4	94.7	89.7	91.1
April .....	91.4	109.7	93.1	71.7	98.7	88.9	94.3	86.0	93.7
May .....	75.4	90.6	93.0	79.8	90.2	99.4	93.7	98.8	93.8
June .....	81.0	96.6	94.2	103.1	97.8	95.9	93.2	99.4	92.9
July .....	92.9	107.5	103.2	121.5	97.5	100.9	103.5	100.7	99.1
August ....	103.1	108.0	104.3	123.2	98.1	101.8	103.8	100.0	109.1
September .	94.8	†	106.4	127.0	102.7	102.5	103.6	102.0	107.7
October ...	66.1	†	111.9	142.6	105.9	106.7	103.6	101.1	113.1
November .	89.8	†	105.3	120.8	102.6	107.0	106.5	105.4	113.2
December .	97.9	†	109.2	127.5	107.1	121.1	114.0	121.0	121.1
1920 January ...	112.8	126.0	112.8	144.2	108.1	123.2	116.8	131.0	133.8
February ..	117.6	127.1	106.6	121.8	107.2	121.2	115.3	118.5	120.3
March ....	119.6	135.6	108.7	118.5	108.8	124.6	124.8	121.3	126.7
April .....	98.9	124.0	109.6	112.5	107.7	121.0	127.5	129.1	122.4
May .....	105.8	127.8	101.9	91.5	109.2	116.3	111.2	119.1	122.3
June .....	113.1	125.8	108.6	84.4	109.7	122.0	111.6	116.6	121.4
July .....	114.1	115.9	104.4	71.2	110.1	122.6	111.3	113.4	119.0
August ....	115.4	114.5	99.7	87.2	110.1	112.8	97.7	113.7	114.2
September .	115.8	111.2	98.2	77.9	109.7	115.3	105.1	111.0	117.8
October ...	116.5	103.2	79.0	84.0	104.2	108.4	96.2	107.5	99.7
November .	107.5	95.3	72.1	58.0	106.8	110.2	96.3	106.2	76.6
December .	98.1	92.7	64.4	50.7	107.6	101.4	95.9	104.4	73.7
1921 January ...	88.5	90.4	66.1	62.6	101.7	79.1	77.6	85.3	64.7
February ..	77.4	77.8	81.2	68.9	96.5	81.8	77.6	90.3	82.5
March ....	52.5	61.6	79.5	79.4	90.0	75.9	71.4	87.4	79.4
April .....	40.8	63.8	76.8	86.3	95.4	62.9	63.9	86.6	74.1
May .....	39.8	59.8	80.1	89.6	65.0	62.9	60.3	87.0	63.2
June .....	39.5	43.5	88.5	109.6	72.1	67.6	52.5	76.0	65.7
July .....	32.7	34.6	80.0	101.3	78.4	61.2	48.8	63.7	52.1
August ....	34.4	38.6	95.0	126.8	86.3	66.6	46.5	79.0	63.5
September .	36.9	37.1	101.8	129.4	89.7	72.9	56.1	88.3	77.0
October ...	41.0	46.0	96.2	140.6	83.5	78.2	59.1	90.0	83.0
November .	51.0	54.9	108.9	....	....	....	....	....	....

\* For original items of these series, see "Current Statistics."

† Data not available.









